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Study of MAS practice and knowledge and bibliographic references for management advisory services : MASPAK

Lynn J. McKell

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An AICPA Report
on Management
Consulting by CPAs

A Study of
**MAS Practice
and Knowledge
and
Bibliographic
References for
Management
Advisory Services**

A report presenting (1) the findings of a study about the practice and the backgrounds of CPAs who perform management consulting and (2) a bibliography of management consulting reference sources.

AICPA American Institute of Certified Public Accountants

**An AICPA Report
on Management
Consulting by CPAs**

**A Study of
MAS Practice
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and
Bibliographic
References for
Management
Advisory Services**

Lynn J. McKell, Ph.D., CDP

and

Kevin D. Stocks, Ph.D., CPA

NOTICE TO READERS

This report is published by the Management Advisory Services Division for the information of AICPA members. The division commissioned professors Lynn J. McKell, Ph.D., CDP, and Kevin D. Stocks, Ph.D., CPA, of Brigham Young University to develop a current MAS bibliography and to survey CPA firms and AICPA members about MAS practice and knowledge. The study was a follow-up to the 1976 study, *Management Advisory Services by CPAs*.

This report presents the authors' findings and conclusions based on the completed surveys. It does not represent an official position of the AICPA's Management Advisory Services Division.

McKell, Lynn J.

A study of MAS practice and knowledge and bibliographic references for management advisory services.

"An AICPA report on management consulting by CPAs."

Bibliography: p.

1. Accountants--United States. 2. Business consultants--United States. 3. Industrial management--Bibliography. I. Stocks, Kevin D. II. American Institute of Certified Public Accountants. III. Title. IV. Title: MAS practice and knowledge and bibliographic references for management advisory services. V. Title: MASPAK.

HF5616.U5M34 1987 016.6584'6 87-19491

ISBN 0-87051-002-9

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1211 Avenue of the Americas, New York, N.Y. 10036-8775
1 2 3 4 5 6 7 8 9 0 MAS 8 9 8 7

Preface

In 1976, the AICPA published the monograph "Management Advisory Services by CPA's" commonly entitled the MASBOKE study. MASBOKE addressed the characteristics of the body of knowledge used by management advisory services (MAS) practitioners in CPA firms and problems which might be encountered in testing for such knowledge. The ensuing years have resulted in tremendous growth in MAS practice. Additionally, the scope of practice and the role of MAS practitioners with CPA firms have changed substantially. In response to these changes, the MAS Education and Professional Education Subcommittee of the AICPA in 1984 initiated a study to reevaluate the status of MAS practice within CPA firms. This monograph is the result of that study.

This current study, Management Advisory Services Practice and Knowledge (MASPAK), is not simply a replication of the prior MASBOKE study. MASPAK focuses on the characteristics of MAS practice, the characteristics of MAS practitioners, and the types and sources of general knowledge necessary for MAS practice. An updated version of the knowledge concept references found in MASBOKE will be presented as a separate report. At the time the MASPAK study was commissioned, there was no impetus to review the examination concepts presented in MASBOKE; therefore, this was not included in the MASPAK study.

Data collection process

The data reported in the study was gathered in the spring and summer of 1985 through the use of questionnaires directed to MAS practitioners and to chief MAS partners of CPA firms. MAS practitioners were selected from an AICPA directory of CPA's indicating an interest in MAS practice. From this listing, 714 usable responses were received. Responses from MAS practitioners are grouped by firm classification into individual, local, regional, national, and multinational firm practitioners.

Firm questionnaires were sent to randomly selected firms from a list of firms at the AICPA office. A total of 86 usable firm responses were collected. Responses from firm representatives are grouped into local, regional, national, and multinational firm classifications.

The questionnaires sent to the practitioners and firm representatives were not identical. Practitioners were asked for personal demographic data, career path information, and educational degrees obtained. Firm representatives were asked for firm demographic data, expected firm direction and growth, and firm employment expectations. Although the questionnaires were not identical, several questions were very similar. Both practitioners and firm representatives were asked the significance of various training programs, the significance of various knowledge and practice areas, and feedback on important business skills and personality traits for MAS practitioners. Where

meaningful, comparisons are made between the practitioner and firm representative responses.

Report format

The report is organized into ten chapters. Chapter 1 provides an overview of MAS practice. MAS practice is defined, justification for CPA involvement in MAS activities is examined, and the general process of MAS practices is reviewed. Chapter 2 provides a condensed summary of the findings of the study. Chapters 1 and 2 may be considered as an executive summary of the project. Chapters 3 through 10 provide additional data and insights to the material found in Chapters 1 and 2.

Chapter 3 examines the survey demographic data. Response rate to the questionnaires and data on the individuals responding are examined. Chapter 4 provides data from the questionnaires on general MAS practice characteristics. Chapter 5 examines the skills and knowledge areas deemed necessary for MAS practice. Chapter 6 discusses the personality traits felt to be important for MAS practitioners. Chapter 7 examines the relative significance of various MAS practice areas. Chapter 8 reviews the training and education of MAS practitioners. Chapter 9 examines the career paths of the responding MAS practitioners. Chapter 10 discusses the future of and entry into MAS practice.

Value and limitations of the report

Two factors should be kept in mind as one studies the report.

1. All respondents are CPA's. This is not a limitation with regard to the AICPA as all MAS practitioners who are members of the AICPA were potential subjects for inclusion in the data collection process. It may be limitation in that all MAS practitioners in CPA firms are not CPA's.
2. Data was gathered from only a sample of the total population of MAS practitioners. Surveying the entire population of MAS practitioners is not feasible. The sample set was selected in a random manner with sufficient numbers of responses to provide useful data.

The major value of the report is the collection of data from a broad range of respondents on the status of MAS practice by CPAs in CPA firms. The data presented in this report will have a number of valuable uses:

1. The data can be used by AICPA and state committees in developing training, promotional, and recruitment materials in the MAS practice area.

2. Individuals in business will find this report to be useful in identifying the diversity of MAS services available from the CPA profession.
3. CPA firms will find the report useful in examining their own MAS practice organization and administration.
4. Educators will find the report useful in developing or revising curriculum to better provide for the needs of this area of the profession.

ACKNOWLEDGEMENTS

As researchers, we are indebted to a number of individuals for their information, guidance, and constructive criticism. Without this assistance, this study simply would not have been possible.

We express appreciation to the hundreds of MAS professionals who took their time to provide the data for this study. These practitioners represent all levels of responsibility in firms of all sizes throughout the United States.

We are deeply indebted to the AICPA for its support and to the MAS Education and Information subcommittee members for their constructive input in the development and execution of this study. Special appreciation is expressed to subcommittee members Murray A. Klein, Jackie Babicky, Richard S. Savich, and Gregson Parker for their vital assistance.

We are fortunate to have excellent staff support from the School of Management at Brigham Young University. The majority of this was provided by Nina Whitehead, whose patience and attention to detail in the drafting process was invaluable. Assisting her were Janine De Luca and Cheryl DeGraff.

Finally, we wish to acknowledge the overriding support and assistance of Monroe S. Kuttner and Monte N. Kaplan (MAS division, AICPA).

As is the case with almost all research, the knowledge and attributes of MAS practice identified in this study will be altered as time passes. Although we assume responsibility for the accuracy of the data presented and the validity of the inferences made at this time, the reader must assume responsibility for changes made as time passes.

TABLE OF CONTENTS

Chapter 1	
MANAGEMENT ADVISORY SERVICES - AN OVERVIEW	1
What is MAS practice?	1
Why CPA firms offer MAS services	2
Why MAS services are obtained from CPA firms	3
Classification of MAS projects	4
Sources of MAS projects	5
Audit considerations and MAS practice	6
General areas of knowledge required for MAS practice	6
The MAS consulting process	7
Types of MAS projects	8
Specialized areas of MAS knowledge and/or practice	11
Chapter 2	
SUMMARY OF FINDINGS	13
Firm questionnaire demographic data	13
Practitioner questionnaire demographic data	14
MAS practice - general overview	15
Skills and knowledge for the MAS practitioner	16
Personality traits for MAS practitioners	17
MAS practice areas	18
Training and education	18
Entry into MAS practice	20
Practitioner career paths	20
Chapter 3	
SURVEY DEMOGRAPHIC DATA	24
Firm questionnaire data	24
Practitioner questionnaire data	28
Summary and conclusions	30
Chapter 4	
GENERAL OVERVIEW OF MAS PRACTICE	31
Offices with resident MAS	31
Number of MAS practitioners	32
MAS and firm administration	35
CPA practice changes	35
Years of practice experience	37
Out of town travel	39
Summary and conclusions	41
Chapter 5	
SKILLS AND KNOWLEDGE FOR THE MAS PRACTITIONER	43
General business skills	43
General knowledge for MAS practitioners	50
Summary and conclusions	52
Chapter 6	
PERSONALITY TRAITS OF MAS PRACTITIONERS	53
Summary and conclusions	59

Chapter 7	
MAS PRACTICE AREAS	60
Engagements vs. consultations	60
Discipline areas - firms	61
Discipline area - practitioners	63
Industry specialty - firms	65
Industry specialty - practitioners	67
Summary and conclusions	68
Chapter 8	
TRAINING AND EDUCATION OF MAS PRACTITIONERS	70
Training	70
Certification	71
Sources of training	72
Education degrees	75
Improving academic training for MAS	79
Summary and conclusions	81
Chapter 9	
PRACTITIONER CAREER PATHS	83
The Individual firm practitione	83
The Local firm practitioner	86
The Regional firm practitioners	88
The National firm practitioner	90
The Multinational firm practitioner	91
Summary and conclusions	93
Chapter 10	
ENTRY INTO MAS PRACTICE	94
Growth in MAS practice	94
Number of new MAS practitioners	96
Level of entry	97
Source of new MAS staff	98
Summary and conclusions	99

The Bibliographic References For Management Advisory Services
Follows Page 100.

Chapter 1

MANAGEMENT ADVISORY SERVICES - AN OVERVIEW

What is MAS practice?

The practice of management advisory services (MAS) is a dynamic and growing part of many public accounting practices. There remains, however, substantial question on what is MAS. James Redfield defined MAS practice in 1961 as follows:

Management advisory services by certified public accountants may be defined as those services which are designed primarily to furnish advice or assistance to management through a professional relationship with respect to planning, organizing, or controlling any phase of business activity.¹

A more extensive description of MAS has been presented by the AICPA in the following excerpt:

Management advisory services (MAS). The management consulting function of providing advice and technical assistance where the primary purpose is to help the client improve the use of its capabilities and resources to achieve its objectives. For the purpose of illustration, "helping the client improve the use of its capabilities and resources" may involve activities such as

- a. Counseling management in its analysis, planning, organizing, operating, and controlling functions.
- b. Conducting special studies, preparing recommendations, proposing plans and programs, and providing advice and technical assistance in their implementation.
- c. Reviewing and suggesting improvement of policies, procedures, systems, methods, and organization relationships.
- d. Introducing new ideas, concepts, and methods to management.²

¹James E. Redfield. A Study of Management Services by CPAs (Austin, TX: Bureau of Business Research, the University of Texas at Austin, 1961), p. 24.

²American Institute of Certified Public Accountants. Statements on Management Advisory Services, No. 1 (New York: AICPA, 1981), p. 2.

In providing this advisory service, the independent accounting firm applies an analytical approach and process which typically involves--

- o Ascertaining the pertinent facts and circumstances,
- o Seeking and identifying objectives,
- o Defining the problem or opportunity for improvement,
- o Evaluating and determining possible solutions, and
- o Presenting findings and recommendations,

and, following the client's decision to proceed, the independent accounting firm may also be involved in--

- o Planning and scheduling actions to achieve the desired results, and
- o Advising and providing technical assistance in implementing.³

Why CPA firms offer MAS services

In general, there are two reasons why a CPA firm offers MAS services. First, a CPA firm develops MAS capabilities for serving clients in order to meet what it considers to be the range of services required to fulfill clients' needs for a full-service CPA firm. The services available in a CPA firm include tax, auditing, preparation of financial statements, and management advice having varying degrees of structure, specialization, and specificity. Almost all CPA firms offer management services when approached by a client or other entity with a specific problem.

The second reason for a CPA firm to offer MAS services is as part of the firm's strategic growth plans for practice development. Significant competition exists among CPA firms for audit and tax services. Many firms view MAS as the segment of practice which offers the most opportunity for growth and expansion, both in terms of firm size and profitability. As a response to this perceived opportunity, most of the larger and many of the smaller CPA firms have developed full-time staffs that provide a wide range of specialized services to clients, government agencies, and others.

³American Institute of Certified Public Accountants. Statements on Management Advisory Services (New York: AICPA, 1974), pp. 10-11.

In addition to the two reasons stated above, there are several other benefits a CPA firm incurs from offering MAS services. If performed well, MAS projects with current audit or tax clients enhance the confidence and trust that client. This, in turn, improves the CPA's ability to retain and work with the client.

Another benefit of offering MAS services is in the acquisition of new clients. Often a company that cannot be interested in tax or audit services is interested in obtaining help with some specialized problem. From the relationship developed working on the specialized problem, other MAS, audit, or tax opportunities with the business often become available to the CPA firm.

Management advisory services frequently involve the application of new techniques and disciplines. Broadening the scope of expertise of the accounting profession in MAS areas favorably affects other practice areas and enhances the entire profession. For example, EDP know-how developed on a MAS project can be used to improve or enhance the individual's or firm's auditing process. Knowledge of computer software and hardware gained through MAS projects can be readily applied to other activities in the firm. Application of knowledge and skills gained on MAS projects to other areas of the firm's practice is an important benefit of offering MAS services.

Why MAS services are obtained from CPA firms

Management advisory services furnished by the CPA provide many advantages to the client. Some of these are the following:

1. Specialized competence. The firm has special competence in many areas of management practice that is not present in the client's organization. This is especially true of the small or medium-sized client that cannot afford to maintain specialists on its regular staff.
2. Objectivity. The CPA approaches the MAS project with the same objectivity present in an audit. Assumptions and conclusions are based upon well-documented and relevant data. The client's personnel could not be expected to provide this degree of objectivity.
3. Previous experience. The CPA has been exposed to a variety of business problems similar to those experienced by his clients as well as the methods used to solve many of these problems. The CPA can draw upon this background of experience to assist the client in solving problems.

4. Familiarity with client. The CPA who is providing MAS services for a current audit or tax client can draw upon knowledge of the company and its activities gained from previous work with the company. This knowledge of the client can be a substantial benefit in addressing new areas of concern.

Classification of MAS projects

MAS projects vary in complexity and formality. A project might be a one-issue question answered over lunch or it might be an investigation of a multitude of issues over a period of years which is answered in a formally presented written report.

The AICPA has attempted to group MAS projects into two general categories as follows:

MAS consultation. That form of MAS based mostly, if not entirely, on existing personal knowledge about the client, the circumstances, the technical matters involved, and the mutual intent of the parties. It generally involves advice or information given by a practitioner in a short time frame. Usually, information is received through discussions with the client and, by mutual agreement, is accepted by the practitioner as represented. The nature of an MAS consultation and the basis for the practitioner's response are generally communicated to the client orally. The practitioner's response may be definitive when existing personal knowledge is deemed adequate; otherwise, it may be qualified, in which case limitations are stated. A qualified response often reflects cost, time, scope, or other limitations imposed by the client's specific circumstances.

MAS engagement. That form of MAS in which an analytical approach and process is applied in a study or project. It typically involves more than an incidental effort devoted to some combination of activities relating to determination of client objectives, fact-finding, opportunity or problem definition, evaluation of alternatives, formulation of proposed action, communication of results, implementation, and follow-up.⁴

In general, a consultation is of limited scope and rather informal. An engagement is of more extended scope and conducted in a formalized manner. With either type of project, the MAS

⁴American Institute of Certified Public Accountants. Statements on Management Advisory Services, No. 1 (New York: AICPA, 1981), pp. 2, 3.

practitioner must exercise care in providing backup documentation of work conducted for and results provided to the client.

Sources of MAS projects

One source of MAS projects is from current audit, tax, or MAS clients. As a normal part of working with the client, opportunities to improve the client's management, technology, and profitability can be perceived by CPA personnel. These opportunities can be identified for the client. Often, clients themselves will identify problems and ask for the CPA firm's assistance.

A second source of MAS projects is from non-client firms. It is not unusual for a prospective client to approach a CPA firm with which there is no audit relationship and request that it perform certain work for them. Often, organizations request proposals from several CPA firms. The motivation for seeking MAS services from a CPA firm appears to be the reputation, prestige, and credibility of the CPA profession developed over the years.

In the public sector, many consulting opportunities are available that do not arise from a pre-existing audit relationship. While a CPA firm may be approached and asked to perform services, it must often develop or discover these opportunities for itself. Several approaches used to create these opportunities include:

- o Maintain close contact with key officials in those areas where desirable engagements are most likely to occur. This can be accomplished through structured social associations (e.g., county clubs) or through business support organizations (e.g., Chamber of Commerce and Rotary groups). This provides early information about the development of consulting opportunities in which the CPA firm may be interested in preparing a proposal.
- o Develop a strong reputation for general competence and reliability. A reputation that is widely recognized virtually amounts to assurance that the CPA firm will be asked from time to time to prepare a proposal on a particular assignment.
- o Monitor formal sources of information about consulting opportunities and submit proposals as appropriate. This is especially applicable when dealing with government organizations.
- o Develop a specialty in and a relationship with specific industries or business applications. The reputation as the leader or expert in an area will create many project opportunities.

Audit considerations and MAS practice

CPA firms offer a unique service in the performance of financial audits. The performance of an audit engagement requires a level of professional independence. In conducting an MAS project for a current audit client, or for a business which may become an audit client, care must be exercised so that the professional independence needed is not jeopardized.

General areas of knowledge required for MAS practice

Four basic areas of knowledge are required for MAS practice. These areas are summarized as follows:

Knowledge of how the CPA profession operates and how MAS practice fits within a CPA firm.

Knowledge of the client's activities. This would include an understanding of both for-profit and not-for-profit organizations.

Knowledge of proper forms of oral and written communication.

Knowledge of the consulting process and the typical characteristics of MAS projects.

All MAS practitioners operating within a CPA firm need to understand the major characteristics of the accounting profession, including traditional services, ethical standards and legal responsibilities. Knowledge of the accounting profession's policy-making processes, including the roles of state CPA societies and regulatory agencies is also helpful for the MAS practitioner.

In order to operate successfully within a CPA firm, an MAS practitioner must understand the role of the MAS practice within the firm with respect to the other services provided by the firm (audit, tax, accounting services, and other). Understanding the practice orientation and direction of the firm as a whole is necessary to be able to orient MAS activities to the benefit of the firm.

Many assignments MAS professionals undertake are for business organizations. An understanding of how businesses operate and are managed is an essential part of the MAS professional's total knowledge. The general knowledge of the operation and management of business and of business functions should correspond to that knowledge included in the core courses in most accredited college and university business schools. The major functional divisions of a business organization such as accounting, finance, marketing, human resources, and operations are

covered and may be represented as well in certain supportive subjects such as business law, behavioral science, systems theory, quantitative analysis, computer science, economics, and management.

Programs, agencies, and institutions outside the private sector (in government and not-for-profit activities) share many similarities with private sector organizations. The differences, however, are important and critical to an appreciation of public sector MAS work. The economic environment, planning, budgeting, and control processes, sources of revenue, and other concepts are found and described differently in the public sector than in the private sector. The differences merit separate consideration and understanding.

Communication proficiency (both written and oral) is universally stressed as important to the MAS practitioner. In CPA firms, staff training programs and policy manuals, as well as managers themselves, stress the ability to write effective reports, proposals, and letters; note taking and working paper preparation; communicating orally with clients, supervisors, associates, and subordinates; and mastering the essential skills of fact finding through document search, interviews, and survey instruments. Most MAS professionals believe that they would be unable to provide management advisory services, regardless of their technical proficiency, if they were not able to receive and clearly communicate facts, make inquiries, and state conclusions.

Knowledge of the CPA profession and business enables the MAS practitioner to be effective in a professional and working environment. Beyond this, concepts used to identify, analyze, and contribute to the solution of problems in organizations constitute essential knowledge of engagement conduct and MAS practice.

The MAS consulting process

In general, the activities of almost all MAS projects can be subdivided into the following five major phases:

Acquisition and general planning

- Initial contact with the client

- Preliminary survey of issues

- Preparation and presentation (oral and/or written) of project proposal

- Preparation and presentation of an engagement letter clearly specifying the terms of the project-scope, general methodology, direct responsibilities, reporting benchmarks, and remuneration

Detailed planning

Outline phases, tasks and steps for conducting the project
 Identify and arrange for personnel (CPA and client)
 Prepare detailed time budgets
 Budget expected costs
 Establish quality control checkpoints
 Schedule periodic program reports and conferences with client

Execution

Conduct the actual fieldwork according to plan
 Monitor quality control measures
 Maintain constant communication with client

Drafting and Reporting

Analyze and synthesize the findings of the project
 Develop preliminary solutions and confer with client
 Select problem solution and draft a final report
 Present final report (oral and written) to client

Follow-up

Provide assistance and guidance to client as report findings are implemented
 Maintain communication to enhance client's satisfaction

The steps of an MAS engagement are shown in diagram form in Figure 1.1.

Insert Figure 1.1

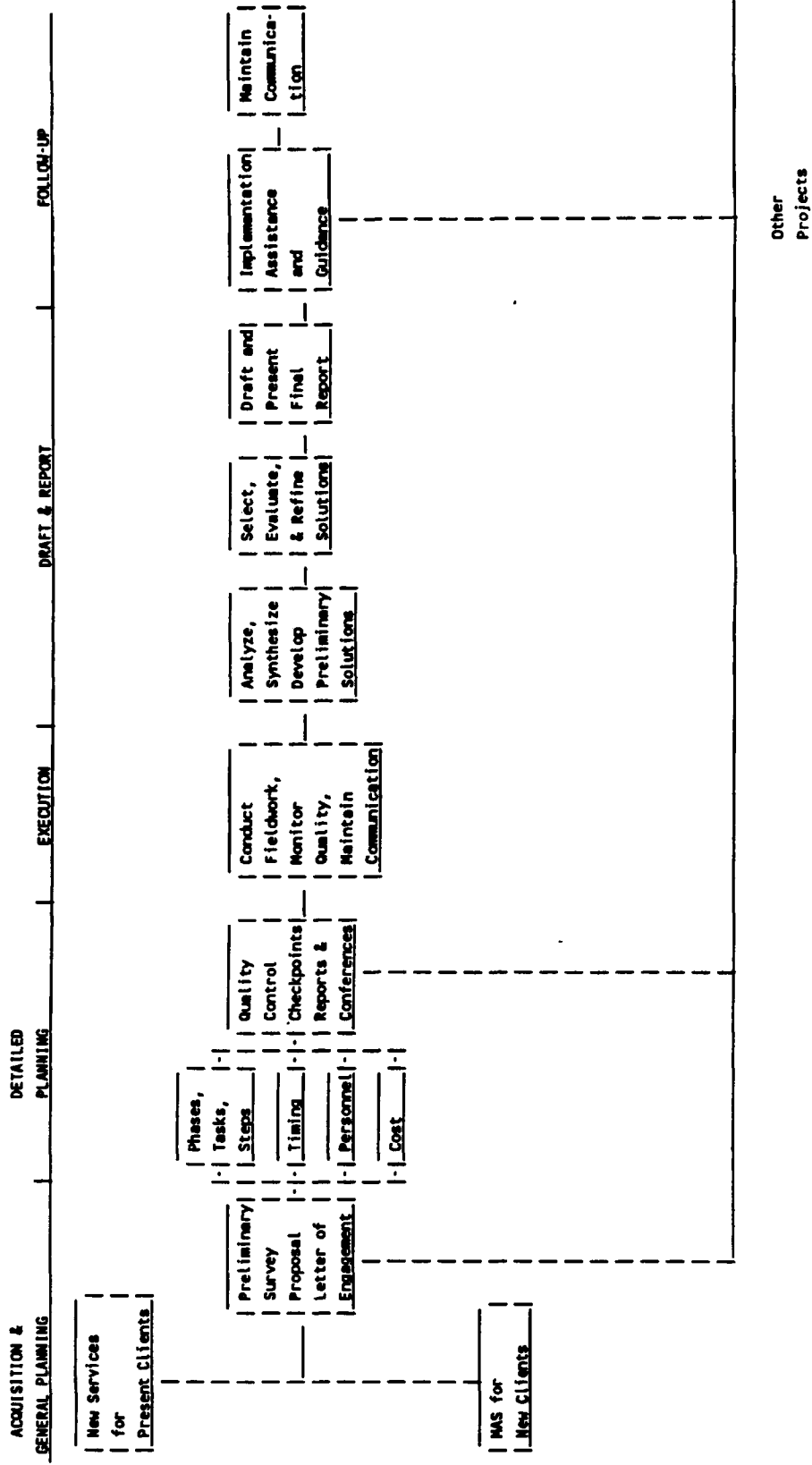
Types of MAS projects

Assembled below are several examples of MAS projects performed by CPAs. These are classified according to the major functions of business management. This is simply a sample of the innumerable projects available to the CPAs. Virtually any problem which an individual involved in business or a not-for-profit organization must address can be the subject of an MAS project.

General Management

Business evaluation for mergers
 Profit improvement programs
 Cost reduction programs
 Merger and acquisition programs
 Diversification studies
 Methods of financing

FIGURE 1.1 THE MAS CONSULTING PROCESS



Other Projects

New business start-up assistance
General advice and consultation

Long-Range Planning

Economic feasibility studies
Development of long-range plans
Evaluation of long-range plans
Establishment of a planning function
Other long-range planning work

Organization and Personnel

Organization planning studies
Personnel evaluation and appraisal
Wage and salary administration
Executive compensation
Executive recruitment

Manpower Utilization

Work measurement--production
Work measurement--clerical
Wage incentive plans

Financial Management

Financial and profit planning
Responsibility accounting systems
Industry cost programs
Overhead expenditure budgeting systems
Capital expenditure budgeting system
Cost determination
Working capital budgeting
Return on investment analyses

Marketing Management

Market research
Marketing controls and procedures
Product profitability analysis
Distribution profitability analysis
Product-line planning
Other marketing work

Production and Operations Management

Production scheduling and control
Inventory analysis and control
Transportation and distribution methods
Warehousing methods and controls
Work simplification
Other production and operations work

Management Sciences

Sampling applications
CPM/PERT applications
Forecasting methods

Optimum location studies
 Computer simulation
 Other mathematical applications

Computer Systems

Systems planning
 Systems development
 Equipment evaluation and selection
 Programming
 EDP operations and controls
 EDP operational problem solving
 Advanced systems development

General Systems (non-EDP)

Management reporting
 Bookkeeping machine systems
 Manual systems and procedures
 Records retention and management

Specialized areas of MAS knowledge and/or practice

Many CPA firms specialize in selected areas of MAS knowledge and/or practice. Specialization is made by discipline (topical area) or by industry (profit line). Below is a brief listing of typical discipline areas and industries in which MAS services are offered.

Selected areas of specialization by discipline:

- a. Management Planning, Implementation, and Control
- b. Systems Concepts, Design, and Installation
- c. Finance and Accounting
- d. Electronic Data Processing
- e. Operations
- f. Human Resources
- g. Marketing
- h. Management Science
- i. Economics
- j. Business Law
- k. Office Automation
- l. Personal Financial Planning
- m. Instruction and Training
- n. Investment

Selected areas of specialization by industry:

- a. Construction
- b. Education
- c. Finance
- d. Insurance
- e. Real Estate

- f. Government (State and Local)
- g. Government (Federal)
- h. Health Care
- i. Not-for-profit Organizations Including Churches and Foundations
- j. High Technology
- k. Manufacturing (Heavy)
- l. Manufacturing (Light)
- m. Retail Trade
- n. Wholesale Trade
- o. Service Firms

Chapter 2

SUMMARY OF FINDINGS

MAS practice within the public accounting profession is growing rapidly in terms of both hours and revenue. It is increasingly becoming important for all CPA practitioners to understand the role, process, and characteristics of MAS activities.

MAS practice is the process of assisting a client as an objective consultant in addressing an issue or problem. CPA's are frequently called to provide MAS services because of their established relationship with a client, specialized competence, professional objectivity, and previous experience.

CPAs engage in MAS practice in order to present the firm as a full service firm. Growth and development in the MAS area is part of the strategic growth plan for many firms. MAS practice also serves to attract new clients for other practice areas as well as to strengthen the relationship with existing clients.

MAS activities are separated into consultations and engagements. Consultations consist of MAS projects which are relatively short and performed in an informal manner. Engagements are more complicated, longer projects which are performed in a formalized manner.

Sources of MAS work come from both current and noncurrent audit and tax clients. Because of the importance of independence and objectivity in the audit functions, MAS activities with current audit clients should be reviewed carefully to ensure that the professional independence needed for the audit work is not jeopardized.

The following chapters present a tremendous amount of data gathered from MAS practitioners and firm representatives on various aspects of MAS practice with a CPA firm. This data was gathered through two questionnaires (firm and practitioner). An analysis of this data results in a number of conclusions and inferences regarding MAS activities. The major conclusions and inferences are summarized below, grouped under major topical headings. Additional detail and data is presented in the chapters following this summary.

Firm questionnaire demographic data

a. Usable Responses -	Local	41
	Regional	30
	National	5
	Multinational	<u>10</u>
	Total	86

b.	Positions of Firm Respondents -	
	Managing Partners	33%
	Partners	26%
	Director, MAS	17%
	Other	24%

c.	Average Firm Size - Number of Offices	
	Local	1.8
	Regional	5.2
	National	38.0
	Multinational	83.2

d.	Average Firm size - Total Number of Professionals	
	Local	28
	Regional	89
	National	1,229
	Multinational	7,804

Practitioner questionnaire demographic data

a.	Usable Responses -	Individual	100
		Local	441
		Regional	91
		National	21
		Multinational	<u>61</u>
		Total	714

b.	Respondent's Sex -	Male 684
		Female 30

c.	Respondent's Average Age -	
	Individual	41.2
	Local	39.1
	Regional	39.9
	National	39.6
	Multinational	38.0

o 83.2% of all respondents were between 34 and 43 years of age.

o Only 3% of the respondents were younger than 34 years of age.

d. All respondents are CPAs.

MAS practice - general overview

a. Percent of Total Offices with Resident MAS Practitioners

Local	62.5%
Regional	38.1%
National	59.0%
Multinational	46.5%

- o Approximately 50% of all firm offices have a resident MAS practitioner.

b. Percent of MAS Professionals to Total CPA Professionals

Full-time:	Local	7.6%
	Regional	7.7%
	National	12.9%
	Multinational	14.0%

Part-time:	Local	6.0%
	Regional	3.4%
	National	2.6%
	Multinational	0.1%

- o MAS professionals comprise 10-15% of professionals within CPA firms.
- o Only 33% of the Local firms employed full-time MAS practitioners. 93% of the Regional firms and 100% of the National and Multinational firms employed full-time MAS practitioners.
- o 70% of the Local and Regional firms employ part-time MAS professionals while National and Multinational firms employ only 40% and 20%, respectively.

c. Firm Recognition of MAS

- o 80-100% of the Regional, National, and Multinational firms recognize MAS as a separate function.
- o 71% of the Local firms integrate MAS into their overall firm service, only 29% recognize MAS as a separate function.
- o Representation at the executive level varies widely with no apparent relationship to firm size.

d. Non-CPA MAS practitioners can be admitted to the level of partner in 100% of the National and Multinational firms, in 61% of the Regional firms, but in only 28% of the Local firms.

e. Source of Firm Revenue is shifting away from Audit toward MAS practice.

o MAS Revenues - Percent of Total Revenues

	<u>1978</u>	<u>1988</u>	<u>Increase/(Decrease)</u>
Local	7.2%	18.1%	10.9%
Regional	5.0%	17.8%	12.8%
National	10.2%	19.0%	8.8%
Multinational	10.3%	19.5%	9.2%

o Audit Revenues - Percent of Total Revenues

	<u>1978</u>	<u>1988</u>	<u>Increase/(Decrease)</u>
Local	36.3%	32.3%	(4.0%)
Regional	50.4%	38.7%	(11.7%)
National	59.8%	48.0%	(11.8%)
Multinational	68.7%	52.9%	(15.8%)

o Tax Revenues - Percent of Total Revenues

	<u>1978</u>	<u>1988</u>	<u>Increase/(Decrease)</u>
Local	31.9%	30.7%	(1.2%)
Regional	22.2%	24.9%	2.7%
National	26.2%	29.4%	3.2%
Multinational	18.4%	25.0%	6.6%

f. 82.6% of the total respondents reported non-MAS experience in CPA firms for an average of 8.5 years.

5.4% of the total respondents reported MAS experience outside of CPA firms for an average of 6.5 years.

g. Out of Town Travel:

Individual	11.1%
Local	8.4%
Regional	17.8%
National	24.1%
Multinational	28.5%

Skills and knowledge for the MAS practitioner

a. General business skills - Most frequently mentioned skill

o Firm representatives - Communication
(All firms classifications)

o Practitioners

Individual	- Communication
Local	- General Taxation
Regional	- Human Resources
National	- Planning
Multinational	- Salesmanship

b. General Knowledge Areas: Level of significance of listed general knowledge areas per firm representative

Most significant - Professional qualities
- Written communication
- Oral communication

Personality traits for MAS practitioners

a. Most frequently identified personality traits for MAS practitioners per firm representatives.

Local	- Communicativeness
Regional	- Communicativeness
National	- Analytical
Multinational	- Communicativeness

Other important characteristics - Technical
Organizational

b. Most frequently identified personality traits for MAS practitioners per practitioners.

Individual	- Communicativeness
Local	- Integrity
Regional	- Knowledge
National	- Patience
Multinational	- Computer*

*Assumed to mean the personality oriented to working in a computer environment.

Other important characteristics - Interpersonal skills
Aggressive
Positive Attitude
Diagnostic Ability
Decisiveness

MAS practice areas

- a. The larger the firm, the higher the proportions of MAS projects considered formal engagements. Multinational firms consider 73.3% of their MAS activities as engagements. Local firms consider 86.3% of their MAS activities as consultations.
 - b. Discipline Areas - Levels of significance and proficiency
 - Most Significant - Per Firm Representative
 - Finance and Accounting
 - Information Services
 - Electronic Data Processing
 - Highest Percentage of Proficient Practitioners
 - Finance and Accounting
 - Management Planning, Implementation, and Control
 - c. Industry Areas - Levels of significance and proficiency
 - Most Significant - Per Firm Representatives
 - Services Firms
 - Real Estate
 - Manufacturing (Light)
 - Highest Percentage of Proficient Practitioners
 - Service Firms
- o There is a wide range in the level of significance indicated by firm representatives for both discipline and industry areas.
 - o In general, those areas of most significance to firms are also those areas indicating the highest percentage of proficient practitioners.

Training and education

- a. Direct entry into MAS practice without audit experience is common for all National and Multinational firms, 57% of the Regional firms, and only 23% of the Local firms.
- b. Smaller firms use a higher percentage of individuals trained primarily in accounting than do larger firms. The larger firms use MAS people trained both in accounting and other disciplines.

- c. 7% of the 714 practitioner respondents hold non-CPA certifications in addition to the CPA. Certified Data Processor, Certified Information Systems Auditor, and Certified Management Accountant were the most prevalent additional certifications.
- d. General knowledge source - Level of significance
- Per Firm Representatives
- | | |
|-------------------|---|
| Most Significant | - Formal college education |
| | - On-the-job training in MAS practice |
| Least Significant | - Continuing education programs by AICPA or state CPA societies |
- Per Practitioners
- | | |
|-------------------|---|
| Most Significant | - On-the-job training in MAS practice |
| Least Significant | - Structured training by your CPA firm |
| | - Continuing education programs by other professional organizations |
- e. Almost all MAS respondents hold at least a Bachelor's degree.
- o Master's degrees become more prevalent as firm size increases. 42% of the Multinational practitioners hold at least one Master's degree.
 - o 72.3% of the Bachelor's degrees held by respondents are in accounting. No other education area at the Bachelor's level accounts for more than 5% of the respondents.
 - o 35.7% of the Master's degrees held are in Accounting. 28% are from Business Management, 11.4% from Business Finance, and 6.5% from other business areas.
- f. Communication and interpersonal skills were identified as the areas in which educational programs needed to concentrate the most. No educational area was identified as needing less attention.

Entry into MAS practice

- a. Growth in MAS practice revenues during the period 1979-1983 ranged from 64% for Local firms to 187% for Regional firms.
- b. Average growth in MAS practice revenues expected during the period 1984-1989 ranges from 48% for National firms to 206% for Regional firms.
- c. Average number of new MAS hires per firm during the period 1984-1989.

Local	4
Regional	12
National	124
Multinational	1,636

- d. 56% of the Local firms and 41% of the Regional firms hire new MAS practitioners only at the advanced level. 31% of the Local and 10% of the Regional firms hire new MAS practitioners at only the entry level. The remaining Local and Regional firms, as well as all of the National and Multinational firms, hire new MAS professionals at both the entry and advanced levels.
- e. The majority of new MAS hires are from other employment positions. Even so, 31.1% to 44% are directly from college.
- f. Of those new hires directly from college, Local and Regional firms employ a majority of new employees with a Bachelor's degree. National and Multinational firms employ a majority of individuals with Master's degrees.
- g. As firm size increases, the number of new MAS employees from industry increases--Local is 7.6%, Multinational is 41.2%.
- h. As firm size increases, the number of new MAS employees from other positions within the firm (audit and tax staff) decreases--Local is 46%, Multinational is 6.5%.

Practitioner career paths

- a. There are four basic career paths followed by MAS practitioners:
 - 1. Firm advancement
 - 2. CPA industry advancement
 - 3. Interrupted advancement
 - 4. Non-CPA entrance

- b. Advancement to the level of partner is quicker on the average for those staying within the CPA firms than for those experiencing non-CPA positions.
- c. The type of non-CPA experience reported is extremely diverse. No common trend appears at any firm size.

In addition to responding to the questions asked in the questionnaires, many of the practitioners provided comments on MAS practice. A selection of these comments follows.

MAS can be as short and simple as helping a client with a single item of accountability, or as complex as touring the country from a depression to a boom, the larger the project, the greater the need for innovative approaches.

The need for MAS services will probably exceed the need for services such as auditing and accounting. With personal computer, accounting is being shifted to in-house. Auditing, if not required, is too costly to have done annually. Concern about taxes, retirement, etc. will increase need for MAS.

Very rewarding--much more challenging than accounting or auditing.

This is not accounting. There are no clear-cut rules. Don't go into service without creative and open mind.

Anyone who wants to have a MAS practice needs the following:

1. Huge amounts of continuing education
2. Experience
3. Willingness to read everything and work

Requires broad perspective.

In the small firm, MAS is not usually separated from tax and auditing practice and may actually be indistinguishable from tax and accounting services being provided.

Sure wish colleges would teach engagement control, consulting art, client relation, and more about management control systems.

MAS is a learning by doing discipline--Must be pragmatic--Adoption of new ideas across line--You get better as you get older.

One highly technical area that covers all industries is that of data communication and telecommunication. There is a wealth of work in these areas and very few people actually qualified to do the job.

Ability to be objective and be critical, yet do not destroy the morale or confidence of others.

1. We should always understand the client needs objective and clear-cut answers. We should forget our ego and get down to basics and take the client's language.
2. Fees: Do not price yourself out of a job.

If CPAs do not come up with a formal education program (one week to one month CPE) in personal financial planning, other so called non-CPA financial planners will dominate this MAS area and also take from CPAs the related tax work.

MAS is the growth area within CPA firms. More support should be given by AICPA to MAS.

More than any other area of service in an accounting practice, MAS requires experience--books and courses alone won't qualify a person.

The training and experience obtained by 18 years experience in industry plus continued reading of business periodicals is what I feel helps me.

The important thing in my mind is to be able to understand the client's business and be willing to challenge management's ideas. Be creative and look for new ways to solve problems and issues.

The key to being a successful MAS practitioner is that you must understand business and you must understand people (i.e., have strong interpersonal skills). There are very few very successful MAS practitioners because they simply don't understand how a business should be run (organizationally, financially, marketing wise, promotionally, efficiently, etc.) and they cannot communicate effectively.

It can only be done by experienced people. No degree could get one in proficiently. Years "in the field" are needed.

For most engagements, a combination of good business skills, common sense, experience, and the ability to

communicate are the most important factors for client satisfaction.

Remember that God gave you two ears and one mouth so you should listen twice as much as you talk. Define and identify the problems correctly and the solutions become simple and obvious.

Having been in private industry for two years with a small company (\$10 million in sales), I feel that CPA firm MAS and most management consultation is far too theoretical and not very useful. Attention to "nuts and bolts" problems is far more helpful in smaller practices and businesses than esoteric discussions and thick presentations.

I think in general CPAs do not really look at their client's needs. They don't elicit client's objections, rather they approach engagements based on income for them (CPAs) rather than serve. Example, force an option on client without adequately defining goals of client.

You can put an MAS person in tax or audit, but not vice-versa. Our MAS person is to accounting as a TV newscaster is to television programming or reporting. The MAS person has to make it happen; cannot be an introvert; and must take rejection well. He/she also must be willing to put their neck on the line and thrive in a pressure-filled environment. You can make an auditor, but an MAS person has to be born with a lot of the basics.

Most accountants don't have what it takes to be top notch advisors. Experience in running business will help to make a person a good advisor. To me, MAS is to show client how to maximize profit.

Too many accountants, facing audit and tax profit problems, think MAS is the way to go. Unless you are ready to get your hands dirty, be "brow-beaten" by the client, have your birth rights questioned, etc.--stay away. The day of the formal studies are still there for the big firms, but for locals, you have to be able to make decisions and butt heads to win. Former auditors and tax people lack the basic personality to be any good in MAS.

As the above comments indicate, a wide range of opinions exist on the nature of MAS practice by CPAs.

Chapter 3

SURVEY DEMOGRAPHIC DATA

Two questionnaires were used to gather the data discussed in this report. One questionnaire was directed to the MAS representative of selected CPA firms. The purpose of this questionnaire was to gather data on firms and their MAS practice. The second questionnaire was directed to individual MAS practitioners. This questionnaire was used to gather data on individual MAS practitioners, their backgrounds, career paths, and practices.

This chapter describes the process of selecting firms and practitioners for participation in this study. The response rate to the mailings is discussed. This chapter also presents demographic data collected from the questionnaires on the types of firms represented, the firm position of each respondent, the size of the firms in terms of offices and professionals, and the age and sex of the respondents.

Firm questionnaire data

Firms which received the firm questionnaire (FQ) were randomly selected at the AICPA office from a listing of firms. An initial set of 15 firms were sent the questionnaire as a pilot group in November, 1984. Of these 15, 12 questionnaires were returned with 9 of them usable. Subsequent to this pilot group, a set of 300 questionnaires were sent to randomly selected firms in March, 1985. Of these 300, 77 usable responses were received.

The usable response rate of the FQ is 27.3% (86/315). The relatively low response rate might be attributed to the fact that many of the smaller CPA firms do not recognize a formal MAS function or practice in their firms.

Respondents to the FQ were asked to identify the type of firm they represented. The options from which they were asked to choose included: Individual, Local, Regional, National, and Multinational. No definition of what constituted any particular firm classification was provided to the respondents. They simply self-selected their firm classification. The 86 respondents to the FQ classified their firms as shown in Figure 3.1.

Insert Figure 3.1

Each of the FQ respondents was asked to identify the title of their position in the firm. Responses to this question are found in Table 3.1.

Table 3.1

Position of Respondents

Number of Responses Within Each
Firm Classification

Position Title	Local	Reg'l	Nat'l	Multi	Total	%
Controller	-	1	-	-	1	1.2%
Director, MAS	6	2	2	5	15	17.4%
Manager, MAS	2	2	1	-	5	5.8%
Managing Partner	14	13	-	1	28	32.6%
Partner	12	7	2	1	22	25.6%
President	3	-	-	-	3	3.5%
Proprietor	2	-	-	-	2	2.3%
Secretary	1	-	-	-	1	1.2%
Treasurer	1	-	-	-	1	1.2%
Vice-Chairman	-	-	-	3	3	3.5%
Vice-President	-	2	-	-	2	2.3%
No Reply	-	3	-	-	3	3.5%
Total Responses	41	30	5	10	86	100.0%

As displayed in Table 3.1, the majority of the individuals responding to the firm questionnaire are Managing Partners (33%), Partners (26%), and Director, MAS (17%).

Each respondent was asked to indicate the size of their firm in terms of the number of offices and the number of individuals rendering professional services. Table 3.2 displays the number of offices specified. As one might expect, the average number of offices increases as the firm classification moves from Local to Multinational.

Table 3.2

Number of Offices

Number of Responses Within Each
Firm Classification

Number of Offices Maintained	Local	Reg'l	Nat'l	Multi
1	25	3	-	-
2	5	6	-	-
3	5	5	-	-
4	2	1	-	-
5	-	5	-	-

6	-	2	-	-
7	-	1	-	-

8	-	2	-	-
9	-	1	-	-
11	-	1	1	-
12	1	-	1	-
16	-	1	-	-
20	-	1	-	-
40	-	-	-	1

42	-	-	1	-
45	-	-	1	-
65	-	-	-	1
70	-	-	-	1
80	-	-	1	2
85	-	-	-	1
90	-	-	-	1

100	-	-	-	1
109	-	-	-	1
113	-	-	-	1
No Reply	3	1	0	0

Total number of offices	70	150	190	832
Total number of firms responding	38	29	5	10
Average number of offices per firm	1.8	5.2	38.0	83.2

Of interest in Table 3.2 is the range in the number of offices within each firm category. Local firms predominantly have one office, but one Local firm specifies 12 offices. The Regional firms specify a range of 1 to 20 offices. The National firms range from 11 to 80 offices, while the Multinational firms range in size from 40 to 113 offices.⁵

Table 3.3 displays the number of individuals in the firms who render professional services in audit, tax, accounting services, MAS, or other areas. The Local firms range in size from 1 to 125 individuals with an average of 28. The Regional firms range in size from 5 to 260 individuals with an average of 89. National firms range from 535 to 2,500 with an average of

⁵It appears that for all firms identifying themselves as Multinational, their response was for U.S. practice only.

1,229, while Multinational firms range from 1,010 to 13,647 individuals with an average of 7,804.

Table 3.3

Individuals Rendering Professional Services

Number of Individuals Rendering Professional Services	Number of Responses Within Each Firm Classification			
	Local	Reg'l	Nat'l	Multi

1 - 10	19	1	-	-
11 - 20	9	1	-	-
21 - 30	2	3	-	-
31 - 40	-	-	-	-
41 - 50	1	-	-	-
51 - 60	1	3	-	-
61 - 70	3	4	-	-

71 - 80	-	4	-	-
81 - 90	1	2	-	-
91 - 100	3	3	-	-
101 - 200	2	8	-	-
201 - 1000	-	1	3	-

1010	-	-	-	1
1500	-	-	1	-
2500	-	-	1	-
4000	-	-	-	1
6500	-	-	-	1
6800	-	-	-	1

8000	-	-	-	1
8200	-	-	-	1
9078	-	-	-	1
13000	-	-	-	1
13647	-	-	-	1
No Reply	-	-	-	1

Total Number of Professionals	1,165	2,675	6,144	70,235
Total Number of Firms responding	41	30	5	9
Average Number of Professionals per firm	28.4	89.2	1,228.8	7,803.9

Practitioner questionnaire data

The sample of practitioners selected to receive the practitioner questionnaire (PQ) was drawn from a listing of CPAs who had indicated an interest in MAS. Because of the source of these practitioners, all of the usable responses are from CPAs. It is true that many MAS practitioners within CPA firms are not CPAs. Thus, by including only CPAs in this study, some of the diversity which exists among MAS practitioners is missing. However, by using a set of practitioners with a common feature (all are CPAs), conclusions and recommendations drawn from the data collected are more valid for the AICPA membership.

As with the FQ, a pilot set of questionnaires was sent to 100 practitioners in November, 1984. Only 16 of the 100 questionnaires were returned in a usable form. A set of 2,000 questionnaires were sent to practitioners in March, 1985. Of these 2,000, 295 were returned in a usable form. Several practitioners indicated that the timing of the mailing was poor (tax season). As a result, in June, 1985 another mailing of 2,000 questionnaires was made. Of this last mailing, 403 usable responses were received.

The usable response rate for the PQ is low at 17.4% (714/4100). This may be explained to a large part by the fact that the name list from which the mailings were made contained those who indicated interest in MAS. Interest in MAS is often not related to direct practice in MAS. Hence, the percentage of individuals who were sent questionnaires but who might not practice in MAS could be significant, contributing to the low response rate. In spite of the low percentage return, 714 responses are more than sufficient to provide useful insights into MAS practice.

Respondents to the PQ were asked to specify the type of firm with which they were associated. The 714 usable responses were classified as follows:

<u>Firm Classification</u>	<u>Number of Respondents</u>
Individual (Indiv)	100
Local (Local)	441
Regional (Reg'l)	91
National (Nat'l)	21
Multinational (Multi)	<u>61</u>
Total	714

Note that in contrast to the FQ, there are sufficient responses in the "Individual" classification to list it separately from the "Local" classification. Also, as in the FQ, no

description was given of each firm's classification; respondents self-selected their firm designation.

A second question asked for the respondent's gender. As shown in Figure 3.2, only 4.2% of the responses are from females. The firm classification with the largest percent of females is the Individual classification with 9%. Although changing, many practitioners have indicated that the MAS practice is the area within the CPA firm with the lowest percentage of females. As one practitioner indicated (and data in Chapter 10 substantiates), MAS typically brings experienced people into entry level positions and females, historically, have not had the experience.

Insert Figure 3.2

A third demographic question asked practitioners to identify their age. Responses to this question are shown in Table 3.6. The mean and medium ages of respondents are between 38 and 41.2 for all firm classifications. It would appear from the responses that MAS practitioner's older than 55 are most likely found in the smaller firms.

Table 3.4

Age of Respondents

Number of Responses Within Each
Firm Classification

Age	Indiv	Local	Reg'l	Nat'l	Multi	Total
26 - 30	-	9	-	-	1	8
31 - 35	10	63	9	3	13	98
36 - 40	48	263	56	12	37	416
41 - 45	23	68	15	3	9	118
46 - 50	12	18	4	2	-	36
51 - 55	2	9	3	1	-	15
56 - 60	3	5	2	-	1	11
61 - 65	2	2	1	-	-	5
66 - 70	-	1	-	-	-	1
71 - 75	-	1	-	-	-	1
76 - 80	-	1	-	-	-	1
Average	41.2	39.1	39.9	39.6	38.0	39.4
Median	39.5	38	38	38	38	38
Number of responses	100	438	90	21	61	710

Of interest in the data on practitioners' age is the fact that 83.2% of all responses were from practitioners between the ages of 34 and 43. Also of interest is the fact that only 3% (21 of 710) of the responses were from practitioners younger than 34 years of age.

Summary and conclusions

Two questionnaires were used to gather data on MAS practice. One questionnaire was sent to 315 randomly selected CPA firms. Eighty-six usable responses from firms were received. Of these, 41 were from Local firms, 30 from Regional firms, 5 from National firms, and 10 from Multinational firms. Those individuals responding to the questionnaire were Managing Partners (33%), Partners (26%), Directors of MAS (17%), and other individuals within the firm (24%).

Demographic data gathered from the FQs reveal the average number of offices and the average number of professionals as shown below.

	<u>Average Number of Offices</u>	<u>Average Number of Professionals</u>
Local	1.8	28
Regional	5.2	89
National	38.0	1,227
Multinational	83.2	7,804

The second questionnaire was directed to CPA practitioners. Of the 4,100 questionnaires sent, 714 usable responses were collected. Of these 714 responses, 100 were from Individual practitioners, 441 from Local practitioners, 91 from Regional practitioners, 21 from National practitioners, and 61 from Multinational practitioners.

All of the practitioners responding to the questionnaire were CPAs. The majority of the practitioners were male (684 of the 714). The average age across all firm sizes averaged between 38 and 41.2 years with 83.2% of all respondents between 34 and 43 years of age.

Chapter 4

GENERAL OVERVIEW OF MAS PRACTICE

This chapter provides an overview of the practice of MAS within CPA firms. Data from the FQ will be used to discuss the number of offices and individuals involved in MAS practice, the relationship of MAS practice to firm structure, and the change in CPA practice areas over a ten-year period. Data from the PQ will be used to discuss the experience level of the MAS practitioners, the type of projects engaged, and the percentage of out-of-town travel incurred.

Offices with resident MAS

Respondents to the FQ were asked to indicate the number of offices in their firm which maintained resident MAS practitioners. Table 4.1 displays the response to this question.

Table 4.1

Offices With MAS Practitioners

Number of Offices With Resident MAS Practitioners	Number of Responses Within Each Firm Classification			
	Local	Reg'l	Nat'l	Multi
1	23	14	-	-
2	4	10	-	-
3	-	3	-	-
4	-	1	-	-
5	-	1	1	-
7	-	1	-	-
12	-	-	1	1

25	-	-	1	2
30	-	-	1	1
33	-	-	-	1
40	-	-	1	1
41	-	-	-	1
48	-	-	-	1
63	-	-	-	1
70	-	-	-	1
No Reply	14	0	0	0

Total number of offices with resident MAS practitioners	31	59	112	387
Average number of	1.1	2.0	22.4	38.7

offices per firm with
resident MAS practitioners

Percent of total of-	62.5%	38.1%	59.0%	46.5%
fices with resident MAS*				

*Computed by dividing average number of MAS offices per firm by the average number of total offices per firm from Table 3.4.

The percentage of total offices which maintain resident MAS practitioners range from a high of 62.5% for Local firms to a low of 38.1% for Regional firms. An overall average would approximate 50%. That is, about 50% of the offices of the responding CPA firms maintain a resident MAS practitioner.

Number of MAS practitioners

FQ respondents were asked to indicate the number of full-time professionals within the firm that practice MAS on a full or a part-time basis. Full-time practice is defined as over 80% of total working hours while part-time is defined as 25% to 80% of total hours. Table 4.2 displays the number of full-time MAS practitioners specified. Table 4.3 displays the number of part-time MAS practitioners.

Table 4.2

CPA Practitioners - Full-Time MAS

Number of Full-Time (80-100%) MAS Professionals	Number of Responses Within Each Firm Classification			
	Local	Reg'l	Nat'l	Multi
0	27	2	-	-
1	3	4	-	-
2	3	3	-	-
3	1	5	-	-
4	2	1	-	-
5	1	4	-	-
6	-	3	-	-
7	2	-	-	-

8	-	-	-	-
9	1	1	-	-
13	-	2	-	-
14	-	1	1	-
16	-	1	-	-
23	-	1	-	-

40	1	-	-	-
45	-	1	-	-
55	-	-	-	1
71	-	-	1	-
99	-	-	1	-
160	-	-	1	-
200	-	-	-	1
260	-	-	-	1
450	-	-	1	-
700	-	-	-	1
775	-	-	-	1
1000	-	-	-	1
1320	-	-	-	1
1400	-	-	-	1
1750	-	-	-	1
3500	-	-	-	1

Total number of full-time MAS professionals	88	200	794	10,960
Average number of full-time MAS professionals	2.1	6.9	158.8	1,096.0
Percent MAS professionals to total CPA professionals*	7.6%	7.7%	12.9%	14.0%

*Computed by dividing average number of full-time MAS professionals by average number of CPA professionals from Table 3.5.

Table 4.3

CPA Practitioners - Part-Time MAS

Number of Part-Time (25-80%) MAS Professionals	Number of Responses Within Each Firm Classification			
	Local	Reg'l	Nat'l	Multi
0	14	9	3	8
1	10	6	-	-
2	8	4	-	-
3	3	5	-	-
5	3	-	-	-
6	2	2	-	-
7	1	-	-	-
8	-	1	-	-

10	-	1	-	-
11	-	1	-	-
15	-	-	-	1
20	-	1	-	-
40	-	-	1	-
100	-	-	-	1
120	-	-	1	-

Total number of part-time MAS professionals	69	90	160	115
Average number of part-time MAS professionals	1.7	3.0	32.0	11.5
Percent part-time MAS professionals to total CPA professionals*	6.0%	3.4%	2.6%	0.1%

*Computed by dividing average number of part-time MAS professionals by average number of CPA professionals from Table 3.5.

As shown, the percentage of full-time MAS practitioners to total firm practitioners is lowest for the Local firm level at an average of 7.6% and increases with firm size up to an average of 14% for the Multinational firms. The trend is reversed for part-time MAS practitioners. Multinational firms have the lowest percentage of part-time practitioners to total practitioners at 0.1%. The percentage of part-time practitioners to total practitioners increases as the firm size decreases to 6.0% for Local firms.

One other item of interest is the number of Local firms which indicated zero full-time MAS practitioners and the number of National and Multinational firms indicating zero part-time MAS practitioners. Only 33% of the Local firms indicated that they had a full-time MAS practitioner. Comparatively, 93% of the Regional firms and 100% of the National and Multinational firms employed at least one full-time MAS professional. However, approximately 70% of the Local and Regional firms employed part-time MAS practitioners while only 40% of the National firms and 20% of the Multinational firms employed part-time MAS practitioners.

From the data observed from Tables 4.2 and 4.3, a general conclusion might be made that smaller firms (Local) tend to do their MAS work with more part-time MAS practitioners (full-time employees who devote only a portion of their time to MAS practice) where larger firms (National and Multinational) tend to employ full-time MAS practitioners to do their MAS work.

MAS and firm administration

The PQ asked three questions dealing with the role of MAS within the CPA firm structure. The first question asked respondents to specify whether MAS practice was a separate function or formal department in the firm or if it was integrated into the firm's overall service. As shown in Figure 4.1, the larger the firm category, the more formalized the organization of MAS practice. Only 29% of the Local firms consider MAS practice as a separate function or a formal department whereas all (100%) of the Multinational firms consider MAS as a separate function or a formal department.

Insert Figure 4.1

As a followup question, those respondents indicating that MAS was recognized as a separate function or a formal department in the firm were asked if the practice area of MAS was represented at the top executive level of the firm. Displayed in Figure 4.2, the responses to this question varied greatly. Even with recognition of MAS as a separate function or a formal department within the CPA firm, 3 of 4 National firms and 13 of 25 Regional firms do not have MAS represented at the executive level of the firm. Even at the Local and Multinational firm levels not all those firms which formally recognized the MAS practice area have representation of the area at the firm's executive level.

Insert Figure 4.2

The third question regarding firm administration asked whether practitioners in the MAS area who do not hold CPA licenses can be admitted to the level of partner in the CPA firm. This condition is generally imposed on practitioners in the other major parts of CPA practice (audit and tax). This issue is of concern in the MAS practice because an increasingly large number of individuals entering the MAS area do not hold CPA licenses. As shown in Figure 4.3, as the firm classification moves from Local to Multinational, the number of firms admitting non-CPA practitioners from the MAS practice as partners increases from 28% to 100%.

Insert Figure 4.3

CPA practice changes

Each respondent to the FQ was asked to specify the total firm revenues (in percentage form) earned in MAS, audit, tax, accounting services, and other areas in 1978, 1983, and expected in 1988. Table 4.4 presents a summary of this data.

Table 4.4
Source of Firm Revenue

1978				
Area of firm practice	Local	Reg'l	Nat'l	Multi
MAS	7.2%	5.0%	10.2%	10.3%
Audit	36.3%	50.4%	59.8%	68.7%
Tax	31.9%	22.2%	26.2%	18.4%
Accounting Services	23.3%	21.0%	3.8%	0.9%
Other	1.3%	1.4%	0.0%	1.7%

1983				
Area of firm practice	Local	Reg'l	Nat'l	Multi
MAS	9.9%	10.2%	13.8%	14.0%
Audit	37.0%	42.9%	54.4%	60.4%
Tax	31.6%	24.8%	27.8%	22.2%
Accounting Services	20.8%	20.1%	4.0%	1.2%
Other	0.7%	2.0%	0.0%	2.2%

1988 (Estimated)				
Area of firm practice	Local	Reg'l	Nat'l	Multi
MAS	18.1%	17.8%	19.0%	19.5%
Audit	32.3%	38.7%	48.0%	52.9%
Tax	30.7%	24.9%	29.4%	25.0%
Accounting Services	18.1%	16.8%	3.6%	0.8%
Other	0.8%	1.8%	0.0%	1.8%

In this study, the most interesting inference from the data presented in Table 4.4 is in the change in MAS practice. As shown in Figure 4.4, MAS practice as a percent of total firm revenue has been and is expected to grow for all firm classifications. Moreover, the growth for the ten-year period averages over 10% of total firm practice for each of the four firm classifications. In 1988, the MAS practice within CPA firms is expected to be in the range of 17.8 to 19.6% of total practice.

Insert Figure 4.4

There are several other interesting inferences from the data presented in Table 4.4. The first is that audit practice has and is expected to decline as a percent of total revenue for all firm

classifications. As portrayed in Figure 4.5, audit constitutes a majority of practice revenues for National and Multinational firms. In all cases, as the firm classification becomes smaller, audit decreases in its portion of practice.

Insert Figure 4.5

A second inference from the data in Table 4.4 is that tax practice has and is expected to grow slightly over the ten-year period from all firm classifications except Local. Figure 4.6 displays the growth trends of tax practice for the four firm classifications. It is also of interest that in 1988, the percent of revenues produced by tax practice for all four of the firm classifications is between 25 and 30 percent.

Insert Figure 4.6

A look at the data in Table 4.4 with respect to Accounting Services practice reveals that this area of practice is rather insignificant in the National and Multinational firms. For the Local and Regional firms, Accounting Services practice appears to be decreasing as a percent of firm revenue from a high of 21 and 23 percent in 1978 to 17 and 18 percent in 1988.

Discussions with CPA practitioners reinforce the inferences drawn from the data in Table 4.4. The general consensus is that Audit is a mature practice area with little growth potential. Tax is becoming a mature area. Accounting Services are being replaced by computerized bookkeeping services. The real area for growth and future potential is in MAS.

Years of practice experience

Respondents to the PQ were asked to specify three types of experience questions. The first question asked how many years the practitioner has been in a CPA firm in some other practice area than MAS. Table 4.5 displays the data collected from this question.

Table 4.5

Experience in CPA Firms,
Outside of MAS

Number of Responses Within Each
Firm Classification

Number of Years	Indiv	Local	Reg'l	Nat'l	Multi	Total
1 - 5	19	93	15	6	16	149
6 - 10	23	82	12	3	11	131

11 - 15	30	157	29	6	15	237
16 - 20	6	43	8	-	2	59
21 - 25	3	5	1	-	-	9

26 - 30	-	1	1	-	-	2
31 - 35	-	2	-	-	-	2
36 - 40	-	1	-	-	-	1
Total number of responses	81	384	66	15	44	590
Average years of non-MAS CPA experience	10.1	10.7	11.0	8.7	8.2	10.4

The second question asked for the number of years of MAS practice within the CPA firm, while the third question asked the number of years in other management consulting firms outside of public accounting. Data from these questions are shown in Tables 4.6 and 4.7.

Table 4.6

Experience in CPA Firms in MAS

Number of Responses Within Each Firm Classification

Number of Years	Indiv	Local	Reg'l	Nat'l	Multi	Total
*****	*****	*****	*****	*****	*****	*****
1 - 5	26	102	15	4	26	173
6 - 10	21	159	34	4	14	232
11 - 15	22	69	23	7	10	131
16 - 20	4	11	2	1	1	19
21 - 25	-	3	1	-	-	4
Total number of responses	73	344	75	16	51	559
Average years of CPA MAS experience	8.6	8.5	9.4	9.8	6.6	8.5

Table 4.7

Experience in MAS Outside of CPA Firms

Number of Responses Within Each Firm Classification

Number of Years	Indiv	Local	Reg'l	Nat'l	Multi	Total
1 - 5	3	9	2	1	9	22
6 - 10	2	3	1	1	2	9
11 - 15	-	4	-	-	1	5
16 - 20	2	-	1	-	-	3
Total number of responses	7	16	4	2	10	39
Average years in MAS outside of CPA firms	8.6	6.7	8.0	6.0	4.1	6.5

From Tables 4.5, 4.6, and 4.7 there are at least two items of interest. The first is that the practitioners in the Multinational firm category are at the low end of the responses for all three questions. For the number of years in CPA firms outside of MAS practice, the average response for the Multinational firm is 8.2 years while the average responses for the other firms range from 8.7 to 11 years. For the number of years in MAS practice within a CPA firm, the average Multinational response is 6.6 years compared to an average response of 8.5 to 9.8 years for the other firms. Finally, for the number of years spent in other consulting firms, Multinational firms show an average of 4.1 years for those responding compared to 6.0 to 8.6 for the other firms.

The second item of interest is the very small percentage of respondents who indicated experience in a non-CPA consulting practice. Slightly over 5% of all PQ respondents specified experience in other consulting firms. Although at first this seems to be a surprising result, it must be remembered that all 714 respondents were drawn from a list of CPAs.

Out of town travel

A final overview question asked in the PQ was the percentage of out of town travel experienced by the practitioners. The responses to this question are shown in Table 4.8.

Table 4.8

Percent of Time in Out-of-Town Travel

Number of Responses Within Each
Firm Classification

Percentage	Indiv	Local	Reg'l	Nat'l	Multi	Total
1 - 10%	50	264	48	8	20	390
11 - 20%	13	42	6	4	12	77
21 - 30%	2	11	9	3	10	35
31 - 40%	1	4	6	3	3	17
41 - 50%	1	1	5	-	7	14

51 - 60%	1	1	1	-	1	4
61 - 70%	1	-	1	-	4	6
71 - 80%	-	-	2	1	2	5
81 - 90%	-	-	-	1	-	1
91 - 100%	-	-	-	-	1	-
Total number of responses	69	323	78	20	60	550
Average percent of time spent in out-of-town travel	11.1%	8.4%	17.8%	24.1%	28.5%	12.8%

Several inferences can be made from this data. First, the percent of time spent in out of town travel generally increases as the firm size increases. This becomes more apparent as the median responses are examined as shown below:

	Median Response Percent of Out of Town Travel
Individual	5%
Local	5%
Regional	10%
National	20%
Multinational	20%

A second issue of interest is the number of no reply responses. Only 1.7% and 5% of the Multinational and National respondents, respectively, did not specify some amount of out of town travel. In contrast, 14% of the Regional practitioners and 27% and 31% of the Local and Individual practitioners, respectively, did not respond to this question. If it could be inferred that no response meant zero out of town travel, the average out of town figures for the smaller firms would decrease quite significantly.

In discussing out of town travel with practitioners, it appears that the type of travel incurred by practitioners in the different firm categories differs. The larger firms tend to have larger projects. When out of town travel is incurred, weeks or even months of travel at a time are required. For the smaller firm, practice is more directed to smaller projects. Hence

travel is for one day or a number of days at a time as opposed to weeks or months.

Summary and conclusions

This chapter has provided an overview of the practice of MAS within CPA firms. Seven basic issues were addressed. A brief summary of each issue follows.

The first issue concerns the distribution of offices with resident MAS practitioners. From the data gathered, it may be concluded that approximately 50% of all firm offices have a resident MAS practitioner. Regional firms indicated the lowest percentage at 38.1%, while National firms indicated the highest percentage at 62.5%.

The second issue is the relative number of MAS practitioners within CPA firms. MAS professionals constitute 10-15% of the total number of professionals. Professionals practicing MAS full-time constitute 7.6% of the Local firm professionals, 7.7% of the Regional, 12.9% of the National, and 14% of the Multinational professionals. Professionals practicing MAS on a part-time basis constitute 6.0% of the Local professionals, 3.4% of the Regional, 2.6% of the National, and only .1% of the Multinational practitioners. From the data, it appears that as firm size increases, the use of practitioners in MAS on a full-time basis, as opposed to a part-time basis, increases.

A third issue is the level of recognition given MAS practice within CPA firms. Data indicates that most (80-100%) of the Regional, National, and Multinational firms recognize MAS as a separate function. Local firms (71%) tend to integrate MAS into their overall firm service rather than recognize MAS as a separate function. Representation at the firm's executive level varies widely among the responding firms with no apparent relationship to firm size.

The fourth issue concerns the admittance of MAS practitioners within CPA firms who are not CPAs to the level of partner. All of the National and Multinational firms admit non-CPA MAS practitioners to the level of a partner (generally termed "principle"). More than half (61%) of the Regional firms, but only 28% of the Local firms, admit non-CPA MAS practitioners to the level of a partner.

The fifth issue is the change in the source of CPA firm revenue. From the data gathered for 1978-1988, audit revenue is decreasing in percent of total firm revenue ranging from a 4% decrease to a 15.8% decrease for Multinational firms. Tax revenue as a percent of total firm revenue is remaining about constant or increasing slightly. MAS revenue as a percentage of

total firm revenue is increasing from 8.8% for National firms to 12.8% for Regional firms. This data indicates a shift in the relative importance in terms of contribution to firm revenue from audit to MAS practice.

A sixth issue is the experience level of respondents within CPA firms and in consulting activities outside of CPA firms. A total of 82.6% of the respondents reported non-MAS experience in CPA firms for an average of 8.5 years. Only 5.4% of the respondents reported consulting experience outside of CPA firms. The average length of this outside experience was 6.5 years.

The seventh and final issue addressed in this chapter is the amount of out of town travel experienced by MAS practitioners. Out of town travel incurred by MAS practitioners ranged from a low of 8.4% for Local practitioners to a high of 28.5% for Multinational practitioners. A general trend, it appears, is that as the firm classification increases, the amount of out of town travel also increases.

Chapter 5

SKILLS AND KNOWLEDGE FOR THE MAS PRACTITIONER

Earlier studies of MAS practice have suggested that a set of skills and a specified body of knowledge may be identified as necessary for all MAS practitioners. In this section, responses from both FQ and PQ respondents on important business skills for MAS practitioners will be examined. Additionally, responses from the FQ respondents on the type of general knowledge needed by all MAS practitioners will be discussed.

General business skills

Respondents to both the FQ and the PQ were asked to specify the three most important general business skills needed by MAS practitioners. Note that these three skills were not requested in order of importance (first, second, and third). Also note that this was an open-ended question; i.e., no alternatives were listed in the questionnaire, rather, the respondents specified their own choices. The responses indicated by the firm representatives are shown in Table 5.1.

Table 5.1

Three Most Important Business Skills

Specified By Firm Representatives

Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses
Communication	19	Communication	13	Communication	3	Communication	4
Logic	8	People Management	7	Analytical	2	Entrepreneurship	3
Technical Knowledge	8	Technical Knowledge	6	Personable	2	Personable	3
Analytical	6	Analytical	5	Technical Knowledge	2	Technical Knowledge	3
Accounting	5	Entrepreneurship	4	Accounting	1	Analytical	2
Computers	5	Problem Solving	4	Computers	1	Organization	2
People Mgt	5	Self-Starter	4	Logic	1	Problem Solving	2
Problem Solving	5	Logic	3	Marketing	1	Accounting	1
Experience	4	MIS	3	Problem Solving	1	Business Finance	1
Entrepreneurship	3	Mgt-Time & Payroll	3	Salesmanship	1	Creativity	1
Inquisitiveness	3	Accounting	2			Integrity	1
Marketing	3	Experience	2			Logic	1
MIS	3	Marketing	2			MIS	1
Organization	3	Computers	1			Mgt-Time & Payroll	1
Planning	3	Cost control	1			People Management	1
Professional	3	Everything	1			Self-Starter	1
Salesmanship	3	Handle Stress	1				
EDP	2	Organization	1				
Keeps Current	2	Personable	1				
Personable	2	Planning	1				

Self-Starter	2	Risk Taker	1				
Creativity	1	Salesmanship	1				
Integrity	1						
Mathematics	1						
Total Responses	100	Total Responses	67	Total Responses	15	Total Responses	28

Several interesting items appear in the data shown in Table 5.1. Most noticeable is that communication skills constitute the general business skill specified most frequently in all firm classifications. This seems to indicate that communication skill is perceived by firm representatives as the single most important general business skill for an MAS practitioner.

A second item of interest is that logic is ranked higher in importance as firm size decreases. Logic skills are among the least mentioned skills of the National and Multinational firms. In the Regional firms it ranks in the middle of the specified skills while in the Local firms it is the second most mentioned general business skill. This may be due to the more broad range of MAS engagements encountered by the practitioners of the smaller firms.

A third item of interest is the general importance of technical knowledge. In all four firm classifications, technical knowledge is listed as the second or third most important general business skill.

The three most important general business skills specified by the MAS practitioners are shown in Table 5.2. Only those skills receiving more than 1% of the total responses within each firm classification are listed individually.

Table 5.2

Three Most Important Business Skills

Specified By MAS Practitioners

Indiv	Number of Responses	Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses
Communication	25	General Taxation	110	Human Resource	21	Planning	7	Salesmanship	22
Computers	14	Objectivity	94	Knowledge-Estate	21	Analytical	5	Statistics	15
Finance	14	Computers	72	Technical Knowledge	20	Finance	3	Contacts	12
Accounting--Cost	14	Results Oriented	51	Objectivity	13	Inventory Systems	3	Analytical	8
Business Economics	14	Creativity	50	Knowledge-Govt. Req	11	Computers	3	Knowledge-Estate	8
Analytical	10	Analytical	47	Salesmanship	11	Knowledge-Estate	3	Reliability	8
Experience	10	Problem Solving	45	Diversification	9	General Lib Arts	2	Thorough	8
Knowledge-Client	9	Compromise	39	Compromise	8	Listening	2	Accounting--MIS	7
Knowledge	8	Diversification	34	Planning	8	Reliability	2	MAS	7

General Taxation Management	8	Technical Knowledge	34	Systems Design	8	Salesmanship	2	Investment Analysis	6
Problem Solving	7	Listening	33	Analytical	7	Acquisition	2	Knowledge-Client	6
Marketing	6	Salesmanship	33	Investment Analysis	7	Knowledge-Client	2	Accounting--Cost	5
Human Resource Mgt.	6	Knowledge	31	Audit-Tax	6	Formal Education	1	Info. Synthesis	5
Common Sense	5	Inventory Systems	30	Contacts	6	Systems Design	1	Professional	4
Knowledge-Business	5	Statistics	27	Systems Analysis	6	Communication	1	Ambitious	3
Teaching Skills	5	Knowledge-Client	25	General Taxation	5	Compromise	1	Insurance	3
Industry Expertise	4	Communication	23	Professional	5	Results Oriented	1	Knowledge	3
Listening	3	Accounting Systems	22	Projecting	5	Innovative	1	Problem Solving	3
Objectivity	3	Systems Design	17	Thorough	5	MIS Development	1	Results Oriented	3
Organization	3	Knowledge-Estate	17	Accounting Systems	4	Statistics	1	Technical Knowledge	3
Reliability	3	Diplomacy	16	Accounting--Cost	4	Raising Capital	1	Common Sense	2
Creativity	3	Work Independently	15	Industry Expertise	4	Work Independently	1	Communication	2
Projecting	3	Systems Analysis	13	Research Skills	4	Self-Confidence	1	Creativity	2
Salesmanship	3	Teaching Skills	12	Computers	3	Human Resource Mgt.	1	Decision Making	2
Technical Knowledge	3	Professional	10	MAS	3	Thorough	1	Listening	2
Research Skills	3	Other*	140	Statistics	3	Accounting--MIS	1	MIS Development	2
Planning	3			Other*	25	Marketing	1	Objectivity	2
Other*	25					Honesty	1	Other*	12
						Other*	0		
Total Responses	227	Total Responses	1040	Total Responses	232	Total Responses	52	Total Responses	165

* Includes those responses which do not individually account for a minimum of 1% of the total classification responses.

Of interest in Table 5.2 is that only in the Individual firm classification is communication skill the most specified general business skill. Moreover, the skills most often specified are different in each of the four other firm classifications. Local firm respondents identified the technical skill of general taxation. Regional and National firms specified administrative type skills of human resource management and planning. For the Multinational respondents, the most specified general business skill is salesmanship.

One interesting feature of the data displayed in Table 5.2 is the great diversity of skills specified by the MAS practitioners. This general diversity appears to suggest that no one skill or set of skills is perceived by MAS practitioners as most essential for an individual in MAS practice.

The business skills specified by the firm's representatives and by the practitioners can be grouped into four major skill types: technical skills, administrative skills, interpersonal skills, and general skills.

A summary of technical skills specified is found in Table 5.3. In all of the firm classifications, technical knowledge is the most frequently specified technical skill listed. Analytical skill was the second most frequent skill listed for all firm classifications.

Among the practitioners, a different technical skill was identified most frequently in each firm classification. In comparison with the firm responses, technical knowledge was not the most frequent response of any of the practitioner classifications although it was close in the Regional firm category. Analytical skill was the most frequent response of the National practitioners and the second most frequent response of the Multinational practitioners.

Of interest in Table 5.3 are the responses of the Local practitioners. In all other classifications, one skill was the most frequently identified. Only in the Regional classification was there a close second. However, in the Local classification, four skills (finance, accounting-cost, computers, and business economics) each were identified by 14 practitioners. This might be explained by the assertion of many Local practitioners that they are each involved in a much broader range of MAS activities than are practitioners in larger firms.

Table 5.3

Three Most Important Technical Skills

Specified By Firm Representatives

	Number of Responses	Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses
Technical Knowledge	8	Technical Knowledge	6	Technical Knowledge	2	Technical Knowledge	3		
Analytical	6	Analytical	5	Analytical	2	Analytical	2		
Accounting	5	Mgt-Time & Payroll	3	Computers	1	Business Finance	1		
Computers	5	MIS	3	Accounting	1	Mgt-Time & Payroll	1		
MIS	3	Accounting	2			MIS	1		
EDP	2	Cost control	1			Accounting	1		
Mathematics	1	Computers	1						

Specified By MAS Practitioners*

Indiv	Number of Responses	Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses
.....									

Finance	14	General Taxation	110	Knowledge-Estate	21	Analytical	5	Statistics	15
Accounting--Cost	14	Computers	72	Technical Knowledge	20	Knowledge-Estate	3	Analytical	8
Computers	14	Analytical	47	Knowledge-Govt. Req	11	Inventory Systems	3	Knowledge-Estate	8
Business Economics	14	Technical Knowledge	34	Systems Design	8	Computers	3	Accounting--MIS	7
Analytical	10	Knowledge	31	Investment Analysis	7	Finance	3	MAS	7
Knowledge-Client	9	Inventory Systems	30	Analytical	7	Knowledge-Client	2	Knowledge-Client	6
General Taxation	8	Statistics	27	Systems Analysis	6	Systems Design	1	Investment Analysis	6
Knowledge	8	Knowledge-Client	25	Audit-Tax	6	Accounting--MIS	1	Info. Synthesis	5
Knowledge-Business	5	Accounting Systems	22	Projecting	5	Statistics	1	Accounting--Cost	5
Industry Expertise	4	Systems Design	17	General Taxation	5	MIS	1	Insurance	3
Technical Knowledge	3	Knowledge-Estate	17	Research Skills	4			Technical Knowledge	3
Research Skills	3	Systems Analysis	13	Accounting--Cost	4			Knowledge	3
Projecting	3			Industry Expertise	4			MIS	2
				Accounting Systems	4				
				Computers	3				
				MAS	3				
				Statistics	3				

* Does not include those skills which received less than 1% of the total firm classification responses.

Administrative skills are summarized in Table 5.4. Of interest in this table is the relatively small number of administrative skills specified. Only 29 of the 210 (13.8%) business skills specified by firm representatives are administrative skills. Of the 1,514 specified skills from practitioners, only 67 (4.4%) are administrative. This appears to suggest that other skills may be the distinguishing factor for an MAS practitioner.

Table 5.4

Three Most Important Administrative Skills

Specified By Firm Representatives

	Number of		Number of		Number of		Number of
Local	Responses	Reg'l	Responses	Nat'l	Responses	Multi	Responses
People Management	5	People Management	7	Marketing	1	Organization	2
Marketing	3	Marketing	2			People Management	1
Planning	3	Planning	1				
Organization	3	Organization	1				

Specified By MAS Practitioners*

Indiv	Number of Responses	Local	Number of Responses	Reg'l	Number of Responses	Net'l	Number of Responses	Multi	Number of Responses
Management	8			Human Resource	21	Planning	7		
Marketing	6	none		Planning	8	Acquisition	2	none	
Human Resource Mgt.	6					Raising Capital	1		
Planning	3					Marketing	1		
Organization	3					Human Resource Mgt.	1		

* Does not include those skills which received less than 1% of the total classification responses.

The third skill classification is for interpersonal skills. As displayed in Table 5.5, firm representatives most frequently specified communication as an important interpersonal business skill. Individual practitioners identified communication skills most frequently. Local and Regional practitioners specified most frequently the interpersonal skill of objectivity. National and Multinational practitioners selected salesmanship, along with listening for the National practitioners.

Table 5.5

Three Most Important Interpersonal Skills

Specified By Firm Representatives

	Local	Number of Responses	Reg'l	Number of Responses	Net'l	Number of Responses	Multi	Number of Responses
Communication		19	Communication	13	Communication	3	Communication	4
Salesmanship		3	Personable	1	Personable	2	Personable	3
Personable		2	Salesmanship	1	Salesmanship	1		

Specified By MAS Practitioners*

Indiv	Number of Responses	Local	Number of Responses	Reg'l	Number of Responses	Net'l	Number of Responses	Multi	Number of Responses
Communication	25	Objectivity	94	Objectivity	13	Listening	2	Salesmanship	22
Teaching Skills	5	Compromise	39	Salesmanship	11	Salesmanship	2	Contacts	12
Listening	3	Listening	33	Compromise	8	Communication	1	Listening	2
Objectivity	3	Salesmanship	33	Contacts	6	Compromise	1	Communication	2

Salesmanship	3	Communication	23	Objectivity	2
		Diplomacy	16		
		Teaching Skills	12		

* Does not include those skills which received less than 1% of the total firm classification responses

A fourth skill category is for those specified business skills which did not appear to be technical, administrative, or interpersonal in nature. Summarized in Table 5.6, logic, entrepreneurship, and problem solving skills are those general skills most frequently identified by firm representatives. Among practitioners, experience, results oriented, diversification, reliability, and thorough skills are all frequently specified.

Table 5.6

Three Most Important General Skills

Specified By Firm Representatives

	Number of Responses	Local	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses	
Logic	8			Entrepreneurship	4	Logic	1	Entrepreneurship	3
Problem Solving	5			Problem Solving	4	Problem Solving	1	Problem Solving	2
Experience	4			Self-Starter	4			Integrity	1
Inquisitiveness	3			Logic	3			Logic	1
Professional	3			Experience	2			Creativity	1
Entrepreneurship	3			Everything	1			Self-Starter	1
Keeps Current	2			Handle Stress	1				
Self-Starter	2			Risk Taker	1				
Creativity	1								
Integrity	1								

Specified By MAS Practitioners*

Indiv	Number of Responses	Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses
Experience	10	Results Oriented	51	Diversification	9	Reliability	2	Reliability	8
Problem Solving	7	Creativity	50	Thorough	5	General Lib Arts	2	Thorough	8
Common Sense	5	Problem Solving	45	Professional	5	Work Independently	1	Professional	4
Reliability	3	Diversification	34			Formal Education	1	Results Oriented	3

Creativity	3	Work Independently	15	Thorough	1	Problem Solving	3
		Professional	10	Results Oriented	1	Ambitious	3
				Innovative	1	Creativity	2
				Honesty	1	Common Sense	2
				Self-Confidence	1	Decision Making	2

* Does not include those skills which received less than 1% of the total classification responses.

General knowledge for MAS practitioners

The MASBOKE study done in the mid 1970's suggested that several general areas of knowledge might be perceived as part of the relevant knowledge base for all MAS practitioners within CPA firms.⁶ Respondents to the FQ were asked to specify the level of significance which on the average most accurately characterizes each of these areas of knowledge. Possible responses included very significant, moderately significant, and not significant.

Table 5.7 shows the responses to this question in graphical form. A not significant response is assigned a value of 1, a moderately significant response a value of 3, and a very significant response a value of 5. The average value of all responses for each firm classification is then calculated. Table 5.7 shows the relative value for each firm's classification on each of the knowledge areas. The underlying data for Table 5.7 is summarized in Appendix B.

Table 5.7

General Knowledge Areas - Level of Significance Per Firm Representatives

General Knowledge Areas -----	Local -----	Reg'l -----	Nat'l -----	Multi -----
Major characteristics of public accounting (Average 2.2)	2.2	2.2	2.6	1.8
The policy-making process in public accounting (Average 1.9)	2.0	1.9	2.2	1.4
The role of MAS and MAS standards in public accounting (Average 4.0)	3.8	4.1	4.2	4.0

International business (Average 1.9)	1.2	1.2	2.6	2.6
Basic characteristics of MAS practice (Average 4.6)	4.1	4.5	5.0	4.8
Classification of MAS services (Average 3.3)	2.9	3.1	3.4	3.8
General MAS approach to engagements (Average 4.5)	4.1	4.5	4.6	4.6
How to conduct an MAS assignment (Average 4.9)	4.7	4.9	5.0	5.0
MAS practice development (Average 3.7)	4.0	4.1	3.4	3.4
Written communication (Average 4.9)	4.6	4.9	5.0	5.0
Oral communication (Average 4.8)	4.7	5.0	4.6	5.0
Professional qualities (Average 5.0)	4.9	4.9	5.0	5.0

1.0 = Not Significant 3.0 = Moderately Significant 5.0 = Very Significant

Two of the knowledge areas appear to be rather insignificant. One of these areas is international business. Although it is not surprising that especially the smaller firms find this knowledge area of little importance, the respondents from the National and Multinational firms also indicate this knowledge area as less than moderately important.

The second knowledge area which does not appear to be significant for the respondents is the policy-making process in the public accounting profession. Of most interest is the fact that the respondents who believe this knowledge area is the least important are from the Multinational firms. Part of the explanation for these responses may stem from the relative youth of MAS practice compared to the practice of Audit and Tax. A second part may be the difficulty faced by the public accounting profession in making policies for a practice area which is as diverse as MAS.

Three of the knowledge areas were identified as very significant. Two of these areas are written and oral communication. This result is consistent throughout the study. Many MAS practitioners have indicated that good communication skills are essential for successful MAS engagements.

The third very significant knowledge area is that of professional qualities. Of the eighty-three respondent to this question, only three failed to identify this knowledge area as very significant. These three did specify professional qualities as a moderately significant knowledge area.

Summary and conclusions

Respondents to both the PQ and the FQ were asked to identify three important general business skills for MAS practitioners. Communication was listed most frequently by firm representatives in all firm classifications as an important general business skill. Individual practitioners also identified communication most frequently as an important skill. Local practitioners mentioned general taxation most frequently, Regional practitioners identified planning, and Multinational practitioners identified salesmanship.

Firm representatives were asked to specify the level of significance of general knowledge areas. From the list of general knowledge areas provided (see Table 5.7), the policy making process in public accounting and international business areas were identified as the least significant. Written and oral communication and professional qualities were identified as the most significant general knowledge areas.

Chapter 6

PERSONALITY TRAITS OF MAS PRACTITIONERS

Prior studies suggest that the desirable personal attributes of the MAS professional include thoroughness, independence, technical competence, and the ability to structure decisions under time pressure. Additionally, MAS practitioners are stimulated by systems and by creativity. They can examine large amounts of unstructured information and identify the underlying problem(s), formulate models and validate them, discard nonrelevant information, gain support for recommendations, and motivate others to carry the recommendations forward to a solution and implementation.⁷

In order to examine the issue of desired personality traits for MAS practitioners, both the PQ and the FQ requested respondents to specify three personality characteristics they believed were most essential to successful MAS practice. As with the general business skills discussed in Chapter 5, this was an open response question and respondents did not rank order the three personality traits.

Table 6.1 displays the three most important personality traits as specified by the firm representatives. Communicativeness is the most frequently mentioned personality trait by two of the firm classifications (Local and Regional) and tied for the most frequent response for Multinational. Of interest is that this personality trait is not mentioned by representatives of the National firms.

Table 6.1

The Three Most Important Personality Characteristics
Reported by Firm Representatives

Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multinational	Number of Responses
Communicativeness	14	Communicativeness	15	Analytical	2	Communicativeness	6
Technical	11	Technical	10	People Person	2	Organization	6
People Person	9	Personality	9	Organization	2	Confidence	3
Personality	8	Confidence	8	Technical	2	Aggressive	2
Confidence	7	People Person	7	Creativity	1	People Person	2
Problem Solving	6	Analytical	6	Experience	1	Reliability	2
Analytical	5	Organization	6	Handle Stress	1	Technical	2
Honesty	5	Reliability	5	Honesty	1	Appearance	1
Creativity	4	Experience	3	Objectivity	1	Enthusiasm	1
Reliability	4	Appearance	2	Personality	1	Honesty	1
Organization	4	Problem Solving	2	Problem Solving	1	Initiative	1
Experience	3	Thorough	2			Leadership	1
Initiative	2	Aggressive	1			Personality	1

⁷Summer, E.L., and K. E. Knight. Management Advisory Services by CPAs. (New York, New York, American Institute of Certified Public Accountants, Inc., 1976.)

Inquisitive	2	Aptitude	1	Problem Solving	1
Appearance	1	Creativity	1		
Computers	1	Honesty	1		
Enthusiasm	1	Initiative	1		
Entrepreneurship	1	Innovative	1		
Innovative	1	Inquisitive	1		
Leadership	1	Leadership	1		
Open Minded	1	Open Minded	1		
Salesmanship	1	Salesmanship	1		

Total Responses . . 92 Total Responses . . 85 Total Responses . . 15 Total Responses . . 30

Technical ability is the second most frequent trait specified in the Local and Regional firms. For National and Multinational firms, technical ability is ranked first and third respectively. This would indicate that a basic personality trait desired in MAS practitioners is a technical orientation.

One trait ranked highly by all firm groups is organization. This trait is ranked as one of the most specified trait for both National and Multinational firm classifications. As firm size decreases, this trait is mentioned less frequently.

Table 6.2 presents the three most important personality traits as specified by MAS practitioners. Only those traits receiving more than one percent of the total responses within a firm classification are listed separately.

Table 6.2

The Three Most Important Personality Characteristics Reported by MAS Practitioners

Indiv	Number of Responses	Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses
Communicativeness	24	Integrity	118	Knowledge	30	Patience	6	Computer	22
Interpersonal Skills	20	Aggressive	89	Positive Attitude	25	Diagnostic Ability	5	Decisiveness	15
Listening	14	Technical	81	Leadership	19	Obtain Clients	4	Objectivity	11
Knowledge	11	Broad Acc Background	52	Broad Acc Background	12	Problem Solving	4	Aggressive	10
Common Sense	10	Communicativeness	42	Versatility	11	Entrepreneurial	3	Awareness	9
Flexible	10	Problem Solving	42	Analytical	9	Contacts	2	Organization	8
Outgoing	10	Enthusiasm	37	Appearance	9	Empathy	2	Diagnostic Ability	6
Confidence	10	Open Minded	37	Mature	7	Formal Education	2	Enthusiasm	5
Integrity	8	Decisiveness	35	Objectivity	7	Integrity	2	Leadership	5
Patience	8	Knowledge	35	Patience	7	Objectivity	2	Sensitivity	5
Analytical	7	Thorough	29	Common Sense	6	Outgoing	2	Sobriety	5
Understanding	7	Experience	25	Communicativeness	6	Positive Attitude	2	Accuracy	4
Congenial	6	Risk Taker	25	Efficient	6	Risk Taker	2	Contacts	4
Empathy	6	Flexible	22	Aggressive	5	Unselfishness	2	Creativity	4
Problem Solving	6	Good Personality	20	Ambition	5	Ambition	1	Quality Oriented	4
Appearance	5	Patience	20	Progressive Attitude	5	Appearance	1	Confidence	4

Creativity	5	Empathy	19	Salesmanship	5	Communicativeness	1	Versatility	4
Organization	5	Interpersonal Skills	19	Creativity	4	Competence	1	Empathy	3
Decisiveness	4	Diagnostic Ability	17	Inquisitive	4	Congenial	1	Flexible	3
Responsiveness	4	Mature	17	Interpersonal Skills	4	Creativity	1	Inquisitive	3
Salesmanship	4	Efficient	16	Risk Taker	4	Enthusiasm	1	Integrity	3
Self-Discipline	4	Humor	16	Availability	3	Innovative	1	Listening	3
Accuracy	3	Organization	16	Competence	3	Interpersonal Skills	1	Salesmanship	3
Dependability	3	Objectivity	15	Decisiveness	3	Mature	1	Technical	3
Diagnostic Ability	3	Obtain Clients	14	Open Minded	3	Organization	1	Entrepreneurial	2
Enthusiasm	3	Unselfishness	14	Respectfulness	3	Professionalism	1	Problem Solving	2
Objectivity	3	Accuracy	13	Self-Discipline	3	Sobriety	1	Progressive Attitude	2
Positive Attitude	3	Creativity	12	Unselfishness	3	Thorough	1	Other*	12
Progressive Attitude	3	Formal Education	12	Other*	24	Other*	0		
Sensitivity	3	Positive Attitude	12						
Technical	3	Self-Discipline	12						
Thorough	3	Progressive Attitude	11						
Versatility	3	Other*	119						
Other*	20								

Total Responses - - 241 Total Responses - - 1063 Total Responses - - 235 Total Responses - - 54 Total Responses - - 164

* Includes those characteristics which received less than 1% of the classification responses.

In examining the data from Table 6.2, perhaps of most interest is the fact that in the top two traits for each of the five firm classifications, there are ten different personality traits specified. This seems to indicate that no one personality trait is perceived as most important for an MAS practitioner.

Also of interest is that while communication was identified by the firm representative of Local, Regional, and Multinational firms as the most important trait, only the Individual practitioners rate communication as the most cited personality trait. Communication is ranked fifth by Local practitioners, in the middle of the traits ranked by Regional and National firms, and is not even mentioned by Multinational practitioners.

A final issue of interest which appears in the data of Table 6.2 are the personality traits cited most often by Regional and Multinational practitioners. Knowledge is cited most frequently by Regional practitioners, while Multinational practitioners cited computer. At first, these two may not seem to be personality traits. In speaking with practitioners, it was suggested that knowledge referred to the type of personality excited with continual learning. This is the type of individual who is knowledgeable in many areas and enjoys the challenge of learning more in specific areas. The personality trait "computer" refers to an individual's basic aptitude for working with computers. This refers to those individuals who adapt readily to computer work.

The personality traits listed in Tables 6.1 and 6.2 can be divided into three general areas. The first area includes those traits which are basic individual personality traits such as

honesty, integrity, and reliability. Table 6.3 contains a summary of these basic individual personality traits specified by both firm representatives and practitioners.

As shown in Table 6.3, firm representatives specify personality and confidence as among the most important basic personality traits. Practitioners most frequently cited confidence, common sense, integrity, positive attitude, entrepreneurial, and decisiveness as important basic personality characteristics. Aggressiveness is also frequently specified by Local and Multinational practitioners.

Table 6.3

The Three Most Important Basic Personality Characteristics

Reported by Firm Representatives

Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses
Personality	8	Personality	9	Creativity	1	Confidence	3
Confidence	7	Confidence	8	Personality	1	Reliability	2
Honesty	5	Reliability	5	Honesty	1	Aggressive	2
Creativity	4	Inquisitive	1	Handle Stress	1	Personality	1
Reliability	4	Open Minded	1			Enthusiasm	1
Initiative	2	Initiative	1			Honesty	1
Inquisitive	2	Aptitude	1			Initiative	1
Enthusiasm	1	Honesty	1				
Innovative	1	Creativity	1				
Open Minded	1	Aggressive	1				
Entrepreneurship	1						

Reported by MAS Practitioners*

Indiv	Number of Responses	Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses
Confidence	10	Integrity	118	Positive Attitude	25	Entrepreneurial	3	Decisiveness	15
Common Sense	10	Aggressive	89	Versatility	11	Positive Attitude	2	Aggressive	10
Integrity	8	Open Minded	37	Mature	7	Integrity	2	Enthusiasm	5
Creativity	5	Enthusiasm	37	Common Sense	6	Risk Taker	2	Sobriety	5
Self-Discipline	4	Decisiveness	35	Progressive Attitude	5	Enthusiasm	1	Versatility	4
Decisiveness	4	Risk Taker	25	Ambition	5	Sobriety	1	Confidence	4
Responsiveness	4	Mature	17	Aggressive	5	Creativity	1	Creativity	4
Enthusiasm	3	Humor	16	Inquisitive	4	Ambition	1	Integrity	3
Dependability	3	Creativity	12	Risk Taker	4	Mature	1	Inquisitive	3
Versatility	3	Positive Attitude	12	Creativity	4			Entrepreneurial	2
Progressive Attitude	3	Self-Discipline	12	Decisiveness	3			Progressive Attitude	2

Positive Attitude	3	Progressive Attitude	11	Self-Discipline	3
				Respectfulness	3
				Open Minded	3

* List does not include those characteristics which received less than 1% of the classification responses.

Important interpersonal characteristics are summarized in Table 6.4. As shown, firm representatives specified most frequently the traits of communicativeness and people person as important characteristics. Communicativeness is also the most frequent trait specified by Individual and Local practitioners. Leadership and patience are the most frequent traits of the Regional and National practitioners respectively.

Table 6.4

The Three Most Important Interpersonal Personality Characteristics

Reported by Firm Representatives

Local	Number of Responses Reg'l	Number of Responses Nat'l	Number of Responses Multi	Number of Responses	
Communicativeness	14	Communicativeness	15	People Person	2
People Person	9	People Person	7	Communicativeness	6
Leadership	1	Leadership	1	People Person	2
Salesmanship	1	Salesmanship	1	Leadership	1

Reported by MAS Practitioners*

Indiv	Number of Responses Local	Number of Responses Reg'l	Number of Responses Nat'l	Number of Responses Multi	Number of Responses
Communicativeness	24	Communicativeness	42	Leadership	19
Interpersonal Skills	20	Patience	20	Patience	7
Listening	14	Personality	20	Communicativeness	6
Outgoing	10	Interpersonal Skills	19	Empathy	2
Patience	8	Empathy	19	Unselfishness	2
Understanding	7	Interpersonal Skills	14	Interpersonal Skills	1
Empathy	6	Unselfishness	14	Salesmanship	1
Congenial	6	Unselfishness	3	Congenial	1
Salesmanship	4	Unselfishness	3	Communicativeness	1
Sensitivity	3	Unselfishness	3		

* List does not include those characteristics which received less than 1% of the classification responses.

Table 6.5 summarizes the important work characteristics specified by firm representatives and practitioners. Technical, analytical, and organization are the work characteristics specified by firm representatives. Of interest is that organization is mentioned relatively more frequently as the firm size increases. In the Local firms, organization is ranked fourth. Organization is ranked second with Regional firms and is the most frequently specified trait in National and Multinational firms. Among practitioners, technical, knowledge, diagnostic ability, and computer are identified most frequently as important work characteristics.

Table 6.5

The Three Most Important Work Characteristics

Reported by Firm Representatives

Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses
Technical	11	Technical	10	Analytical	2	Organization	6
Problem Solving	6	Analytical	6	Organization	2	Technical	2
Analytical	5	Organization	6	Technical	2	Appearance	1
Organization	4	Experience	3	Experience	1	Problem Solving	1
Experience	3	Thorough	2	Objectivity	1		
Computers	1	Appearance	2	Problem Solving	1		
Appearance	1	Problem Solving	2				
		Innovative	1				

Reported by MAS Practitioners*

Indiv	Number of Responses	Local	Number of Responses	Reg'l	Number of Responses	Nat'l	Number of Responses	Multi	Number of Responses
Knowledge	11	Technical	81	Knowledge	30	Diagnostic Ability	5	Computer	22
Flexible	10	Broad Acc Background	52	Broad Acc Background	12	Obtain Clients	4	Objectivity	11
Analytical	7	Problem Solving	42	Appearance	9	Problem Solving	4	Awareness	9
Problem Solving	6	Knowledge	35	Analytical	9	Contacts	2	Organization	8
Appearance	5	Thorough	29	Objectivity	7	Objectivity	2	Diagnostic Ability	6
Organization	5	Experience	25	Efficient	6	Formal Education	2	Accuracy	4
Diagnostic Ability	3	Flexible	22	Availability	3	Innovative	1	Contacts	4
Technical	3	Diagnostic Ability	17	Competence	3	Organization	1	Quality Oriented	4
Accuracy	3	Efficient	16			Competence	1	Flexible	3
Objectivity	3	Organization	16			Professionalism	1	Technical	3
Thorough	3	Objectivity	15			Thorough	1	Problem Solving	2
		Accuracy	13			Appearance	1		
		Formal Education	12						
		Obtain Clients	14						

* List does not include those characteristics which received less than 1% of the classification responses.

Summary and conclusions

This chapter discusses personality traits perceived by firm representatives and MAS practitioners as important in MAS practice. The most frequently identified personality traits by firm representatives were communicativeness (Local, Regional, and Multinational) and analytical (National). Other frequently mentioned traits include technical and organizational.

The most frequently specified personality traits by MAS practitioners were communicativeness (Individual), integrity (Local), knowledge (Regional), patience (National), and computer (Multinational). Other frequently mentioned traits include interpersonal skills, aggressive, positive attitude, diagnostic ability, and decisiveness.

Chapter 7

MAS PRACTICE AREAS

One of the questions often posed to MAS practitioners concerns the type of activities or services provided and the areas in which they are provided. This chapter examines the type of activities engaged in by MAS practitioners. Additionally, the significance of work done in different discipline and industry areas is examined.

Engagements vs. consultations

Respondents to the PQ were asked to specify whether the majority of their MAS practice was spent doing consultations, engagements, or both equally as defined by the AICPA (see discussion in Chapter 1). The data collected from this question is presented in Figure 7.1.

Insert Figure 7.1

As might be expected, the smaller firms (Individual and Local) perform mainly consultations. The position of these practitioners is summarized by the comments written on the PQ by four respondents.

Our MAS practice is informal and is an integral part of client service. We deal with small clients where a formal structure is useless.

As a local practitioner, I do not formally label any engagement as MAS. But as compared to time spent on pencil pushing, more of my time is spent advising clients as to the management operations of their business.

In the case of a local firm, MAS cannot be separated from audits and accounting. What we offer is control-ership by the hour.

MAS practice is an outreach of all our tax and audit clients. We often perform the service without realizing it is MAS.

On those larger jobs where specific skills are needed, the smaller firms often hire outside assistance. This approach is summarized by the following comment taken from a PQ.

Our "engagement" portion of MAS is conducted by subcontracting with full-time management consultants on large computer jobs, some special cost accounting and personnel recruiting, speculations, reviews, etc.

While 86-89% of the MAS activities for Individual and Local firms consisted of informal consultations with clients, 43% and

73% of the MAS activities for National and Multinational firms respectively consisted of formal engagements.

Practitioners suggest that the reason for this difference is due to the increased size and level of management sophistication in the clients of the larger firms. These clients have their own controllers and staff and are more likely to engage CPAs for highly complex, specialized problems. This type of activity is more likely to result in formal engagements than in consultations.

A second possible explanation is that as the size of CPA firms increases, the management and practice procedures become much more structured and formalized. Projects which a practitioner from a local firm performs in an informal manner may require a much more formalized approach in a larger firm simply because of the policies of the larger firm.

As a result of the different types of activities performed by practitioners of small and large firms, the level of specialization in any one area also differs. The small firm practitioner generally requires a much broader base of knowledge than a large firm practitioner as reflected in the following two comments.

I work with relatively small clients. I do a lot of the same type of work with my clients that a controller might do otherwise, except I make no management decisions.

Our practice requires a generalist's approach. In our community a "specialist" must specialize in several areas to earn a living.

However, practitioners with large firms often have the opportunity to become a specialist in an area as reflected in the following comment.

My role is to provide technical support personnel with highly developed skills in certain mini and microcomputer systems.

Discipline areas - firms

Many MAS practices are directed towards a specific discipline or set of disciplines. Respondents to the FQ were asked to identify the level of significance in terms of time spent in the following fourteen discipline areas.

Management Planning, Implementation, and Control
Information Systems
Finance and Accounting
Electronic Data Processing
Operations
Human Resources
Marketing

Management Science
 Economics
 Business Law
 Office Automation
 Personal Financial Planning
 Instruction and Training
 Investment

Very significant responses were assigned a value of 5, moderately significant a value of 3, and not significant a value of 1. Table 7.1 displays the relative significance of each discipline area for each of the firm classifications.

Table 7.1
 Discipline Areas - Level of Significance
 Per Firm Representatives

Discipline Areas -----	Local -----	Reg'l -----	Nat'l -----	Multi -----
Management Planning, Implementation, and Control (Average 3.9)	3.0	3.6	4.6	4.2
Information Services (Average 4.0)	3.5	4.5	3.0	5.0
Finance and Accounting (Average 4.1)	4.0	3.6	3.8	5.0
Electronic Data Processing (Average 4.0)	3.7	4.4	3.4	4.6
Operations (Average 3.1)	2.6	2.8	3.4	3.8
Human Resources (Average 2.1)	1.7	1.9	2.2	2.6
Marketing (Average 1.8)	1.7	1.6	1.8	2.0
Management Science (Average 1.7)	1.6	1.8	1.4	2.0
Economics (Average 1.6)	1.7	1.3	1.8	1.6
Business Law (Average 1.3)	1.7	1.3	1.0	1.0
Office Automation (Average 3.1)	2.7	3.5	2.6	3.6

Personal Financial Planning (Average 2.3)	3.2	2.4	2.2	1.2
Instruction and Training (Average 2.6)	2.6	3.3	1.8	2.8
Investment (Average 2.2)	2.4	1.9	3.0	1.4

1.0 = Not Significant 3.0 = Moderately Significant 5.0 = Very Significant

Several interesting observations arise from analyzing the data in Table 7.1. First, only three areas (Finance and Accounting, Electronic Data Processing, and Information Systems) have a simple average score of above 4.0 for all firm classifications. None of these three scored above 4.1. This indicates that no one discipline area is a dominant force in MAS practice.

Four of the discipline areas have a simple average score of less than 2.0 for all firm classifications. This indicates that these areas (Business Law, Economics, Management Science, and Marketing) are of less significance in MAS practice.

Two of the discipline areas exhibit an increase in significance with an increase in firm size. Operations and Human Resources become more significant as firm size increases. Conversely, Business Law and Personal Financial Planning become more significant as firm size decreases.

Discipline area - practitioners

Respondents to the PQ were asked to indicate their level of proficiency in each of the fourteen discipline areas. Respondent indicated they were "highly proficient," "considerably proficient," "somewhat proficient," had "basic proficiency," or had "no knowledge." The percent of respondents indicating "highly proficient" or "considerably proficient" is summarized in Table 7.2. Respondents indicating the lower levels of proficiency in an area most likely do not practice in that area.

Table 7.2

Discipline Areas - Level of Proficiency Per Practitioners

Percent of Responding Practitioners Specifying Proficiency Levels "Considerably Proficient" or "Expert"

Discipline Areas	Indiv	Local	Reg'l	Nat'l	Mult
-----	-----	-----	-----	-----	-----
Management Planning, Implementation, and Control (Average 53.4%)	56.0%	41.2%	53.4%	52.4%	63.8
Information Services (Average 42.7%)	39.6%	31.0%	44.9%	57.1%	40.7%

Finance and Accounting (Average 86.5%)	82.6%	82.4%	86.7%	85.7%	94.9%
Electronic Data Processing (Average 34.5%)	31.9%	29.5%	43.3%	33.3%	34.5%
Operations (Average 36.9%)	43.5%	31.9%	39.8%	28.6%	40.7%
Human Resources (Average 20.2%)	27.5%	25.8%	21.6%	9.5%	16.7%
Marketing (Average 16.6%)	14.3%	13.9%	12.5%	23.8%	18.3%
Management Science (Average 15.6%)	15.4%	13.9%	12.8%	19.0%	16.9
Economics (Average 20.4%)	26.4%	21.0%	15.9%	23.8%	15.0%
Business Law (Average 17.9%)	23.1%	21.6%	15.7%	14.3%	15.0
Office Automation (Average 22.5%)	25.3%	27.1%	29.5%	19.0%	11.7
Personal Financial Planning (Average 39.9%)	59.8%	55.6%	43.8%	23.8%	16.7%
Instruction and Training (Average 33.8%)	43.2%	31.0%	32.9%	23.8%	37.9%
Investment (Average 33.0%)	41.1%	36.1%	24.1%	38.1%	25.4%

Given that all the responding practitioners are CPAs, it is not surprising that the area of Finance and Accounting indicates the highest average of practitioners (86.5%) with proficiency in the area. The only other area in which a majority of the practitioners indicate more than some proficiency is Management Planning, Implementation, and Control (53.4%). Areas indicating the lowest percentage of proficient practitioners include Management Science (15.6%), Marketing (16.6%), and Business Law (17.9%).

It is important to note that a low percentage of practitioners proficient in a discipline area does not indicate an inability of CPAs to service that area. It does indicate that a relatively smaller percentage of all MAS practitioners specialize in that one particular area. Also to be considered is that the survey respondents did not include the non-CPA MAS practitioners in public accounting practice. Individuals trained outside of accounting are often hired by CPA firms to service particular discipline areas.

In comparing the responses of the firms' representatives with those of the practitioners, it appears that those areas of relatively more significance to the firm have a higher percentage

of practitioners proficient in that area. For example, the discipline area receiving the highest significance rating (Financial Accounting, 4.0) also has the highest percentage of proficient practitioners (86.0%). Those areas receiving the lowest significance ratings similarly appear to have the lowest percentage of proficient practitioners.

Industry specialty - firms

In addition to specializing in discipline areas, many practitioners specialize in selected markets or industries. Firm representatives were asked to indicate the level of significance in terms of time spent on each of the following industry areas.

Construction
 Education
 Finance
 Insurance
 Real Estate
 Government (State and Local)
 Government (Federal)
 Health Care
 Not-For-Profit Organizations including Churches
 and Foundations
 High Technology
 Manufacturing (Heavy)
 Manufacturing (Light)
 Retail Trade
 Wholesale Trade
 Service Firms

Responses to this question were assigned a value (5 for very significant, 3 for moderately significant, 1 for not significant). The relative significance of each industry area is displayed by firm in Table 7.3.

Table 7.3

Industry Areas - Level of Significance Per Firm Representatives

Industry Areas	Local	Reg'l	Nat'l	Multi
Construction (Average 3.1)	3.4	3.4	3.0	2.4
Education (Average 1.7)	1.4	1.8	1.5	2.2
Finance (Average 3.4)	2.2	2.9	3.8	4.6

Insurance (Average 2.2)	1.6	2.0	1.8	3.2
Real Estate (Average 3.4)	3.2	3.2	4.6	2.6
State & Local Government (Average 2.8)	2.1	2.5	2.0	4.4
Federal Government (Average 2.0)	1.2	1.3	1.5	4.0
Health Care (Average 3.1)	2.0	2.9	3.0	4.6
Not-For-Profit (Average 3.0)	3.4	2.6	2.2	3.8
High Technology (Average 2.0)	1.6	1.7	1.5	3.0
Manufacturing (Heavy) (Average 2.3)	1.4	2.2	1.4	4.0
Manufacturing (Light) (Average 3.2)	2.8	3.3	2.2	4.6
Retail Trade (Average 3.0)	3.3	2.7	2.6	3.4
Wholesale Trade (Average 3.0)	3.0	2.9	3.0	3.2
. Service Firms (Average 3.6)	3.7	3.6	3.4	3.6

1.0 = Not Significant 3.0 = Moderately Significant 5.0 = Very Significant

Two of the industry areas received a simple average score of less than 2.0. This indicates that these industries (Education and High Technology) are generally not significant practice areas for MAS practitioners.

The industry receiving the highest average score was that of Service Firms. However, even this industry's score was only 3.6, indicating that no one industry really stands out as a significant portion of MAS practice for the majority of CPA firms.

A few trends do appear in this data. The level of significance increases as firm size increases in the Finance and Health Care industries. Conversely, the level of significance decreases as firm size increases in the Construction industry.

Also, it appears from the data in Table 7.3 that in many industry areas, the significance of the area is much higher for Multinational firms than it is for the other firm classifica-

tions. For example, in the Federal Government area, responses from the Multinational firms scored 4.0 while the other three firms scored 1.2, 1.3, and 1.5. This same situation, although not so dramatic, is also seen in Finance, Insurance, State and Local Government, Health Care, High Technology, Manufacturing (Heavy), and Manufacturing (Light). These results appear to indicate that industry identification is more important among Multinational firms than it is among the smaller firms.

Industry specialty - practitioners

Practitioners were also asked to specify their levels of proficiency in each of the industry areas. Table 7.4 displays the percentage of practitioners who are "considerably" or "highly" proficient in each area.

Table 7.4

Industry Areas - Level of Significance Per Practitioners

Percent of Responding Practitioners Specifying
Proficiency Levels "Considerably Proficient" or "Expert"

Industry Areas -----	Indiv -----	Local -----	Reg'l -----	Nat'l -----	Mult -----
Construction (Average 40.9%)	50.0%	44.9%	43.2%	38.1%	28.3
Education (Average 10.5%)	11.4%	11.6%	9.3%	4.8%	15.5%
Finance (Average 38.5%)	41.6%	35.6%	36.8%	38.1%	40.7
Insurance (Average 13.2%)	19.1%	10.5%	11.5%	9.5%	15.3%
Real Estate (Average 39.3%)	52.8%	47.8%	39.5%	42.9%	13.6%
State & Local Government (Average 19.4%)	15.7%	22.9%	16.3%	19.0%	22.8
Federal Government (Average 10.5%)	6.8%	8.8%	9.4%	9.5%	17.9
Health Care (Average 26.6%)	20.2%	15.5%	30.2%	28.6%	38.3%
Not-For-Profit (Average 36.8%)	36.4%	40.3%	37.9%	28.6%	40.7%
High Technology (Average 19.4%)	15.9%	14.2%	17.6%	28.6%	20.7%
Manufacturing (Heavy) (Average 29.8%)	31.5%	26.4%	29.9%	42.9%	18.6%
Manufacturing (Light) (Average 44.5%)	45.5%	39.7%	51.7%	57.1%	28.3%

Retail Trade (Average 45.8%)	53.3%	42.9%	45.5%	20.0%	19.3
Wholesale Trade (Average 36.2)	53.3%	42.9%	45.5%	20.0%	19.3%
Service Firms (Average 59.3%)	67.8%	68.0%	62.1%	61.9%	36.8

Of interest from Table 7.4 is that the only industry in which a majority of respondents are more than somewhat proficient is the service industry at 59.3%. In three other areas (Retail Trade, Manufacturing (Light), and Construction) more than 40% of the responding practitioners indicate they are "considerably" or "highly" proficient. Those industry areas where a very small percentage of practitioners indicate proficiency include Education, Federal Government, and Insurance. As with the data on discipline proficiency, a low percentage of practitioners proficient in an industry does not indicate an inability of CPAs to service that industry. Perhaps of more importance with respect to industry areas than to discipline areas is the practice of public accounting firms to employ non-CPA experts to service particular industries.

As with the discipline areas, there appears to be consistency between an industry's level of significance for a firm and the percentage of practitioners proficient in that industry. This also appears to apply with the ratings among the various firm classifications. For example, Multinational firms rate the Federal Government area as more than twice as significant as the other firm classifications. Similarly, the percent of Multinational practitioners proficient in the Federal Government area is more than twice as much as in any other firm classification.

Summary and conclusions

This chapter examines the type of activities or services provided by MAS practitioners and the significance of work done in different discipline and industry areas. The AICPA has identified MAS activities as either engagements or consultations. The data gathered indicates that the larger the firm, the higher the proportion of MAS activities considered formal engagements. Multinational firms consider 73.3% of their MAS activities as engagements. Local firms consider 86.3% of their MAS activities as consultations and only 13.7% as engagements.

Respondents to both questionnaires were presented with a list of discipline areas and industry areas (see Tables 7.1 and 7.3). Firm representatives were asked to identify the level of significance of each area in MAS practice. MAS practitioners were asked to identify their level of proficiency in each area. Firm representatives identified as the most significant discipline areas: Finance and Accounting; Information Services; and Electronic Data Processing. As the most significant industry areas: Service Firms; Real Estate; and Manufacturing (Light).

The discipline areas in which the highest percentage of practitioners indicated proficiency are Finance and Accounting, and Management Planning, Implementation, and Control. The industry in which the highest percentage of practitioners indicated proficiency is the Service industry. Proficiency of non-CPAs in public accounting MAS practice is not addressed in this study.

In general, there appears to be some consistency between the significance rating of a discipline or industry area and the percentage of practitioners proficient in that area. This appears to extend as well to the differences between significance and proficiency ratings between firm classifications.

Chapter 8

TRAINING AND EDUCATION OF MAS PRACTITIONERS

An important issue for CPA firms is the type and source of training and education needed for a MAS practitioner. This chapter examines the type of training experienced and the professional certifications held by MAS practitioners. Suggested sources of training will be reviewed. The level and type of educational degrees held by the survey respondents will be summarized. Finally, suggestions for improving the educational training for future MAS practitioners will be discussed.

Training

Firm representatives were asked two questions regarding the training of their MAS professionals. The first question addresses an issue which is of interest to many prospective MAS practitioners. Firm representatives were asked to indicate whether or not it is common in their firm for individuals to enter into the MAS area without experience in audit or tax. As shown in Figure 8.1, the larger the size of the firm, the more common it is for individuals to enter into the MAS area without experience in audit or tax. All of the National and Multinational firms surveyed indicated that direct entry into MAS practice is common. Only in 57% of the Regional firms and in 23% of the Local firms is direct entry into MAS practice without audit or tax experience common.

Insert Figure 8.1

The second question asked of firm representatives concerns the basic training of MAS practitioners. These respondents were asked to specify if MAS is performed in their firm by people who were trained primarily in accounting, by people who were trained primarily in other fields, or by both types of people. Data from this question is displayed in Figure 8.2.

Insert Figure 8.2

Based on the study data listed in Table 8.2, it appears that 71% of the Local firms use individuals primarily trained in accounting to do their MAS work. Only 26% of the Regional firms and none of the National and Multinational firms use people trained primarily in accounting to perform MAS work. This trend is reversed with the firm use of individuals trained primarily in non-accounting fields.

Forty percent of the Multinational firms use individuals primarily trained in some area other than accounting to perform MAS activities. Twenty percent of the National firms, 17% of the Regional firms, and only 3% of the Local firms use primarily non-accounting trained individuals in their MAS activities.

For all firm classifications except Local, the largest percentage of firms use both accounting and non-accounting trained individuals in their MAS practice. Fifty-seven percent

Multinational firms use individuals with both types of training to perform the MAS work. In contrast, a relatively small percentage of Local firms (26%) use both accounting and non-accounting trained individuals to perform their MAS work.

Certification

As stated in Chapter 2, all 714 practitioners who responded to the PQ are CPA's. A question in the PQ asked these individuals to specify what other certifications they hold. The non-CPA certifications identified by these practitioners are listed in Table 8.1.

Table 8.1

Certifications Held In Addition To CPA

Certification	Number of Responses in Each Firm Classification					Total
	Indiv	Local	Reg'l	Nat'l	Multi	
CDP - Certified Data Processor		1	2	3	4	10
CISA - Certified Information Systems Auditor		2	3		2	7
CMA - Certified Management Accountant	1		2		3	6
CFP - Certified Financial Planner		5				5
CMC - Certified Management Consultant			2	1	2	5
CSP - Certified Systems Professional		1	1	1	1	4
CPIM - Certified Production and Inventory Control Manager				1	2	3
CBA - Chartered Bank Auditor					2	2
FCA - Fellow of Institute of Chartered Accountants		2				2
FHFMA - Fellow of the Healthcare Financial Association			1		1	2
CHA - Chartered Hotel Administrator				1		1
CIA - Certified Internal Auditor					1	1
FBIM - Fellow British Institute of Management		1				1
FMLI - Fellow of Life Insurance Investments	1					1
LNHA - Licensed Nursing Home Administrator					1	1
Total number of responses	2	12	11	7	19	51
Percent of practitioners with non-CPA certifications	2%	3%	12%	33%	31%	7%

Only 54 of the 714 respondents identified certifications other than the CPA. This small percentage (7%) is a bit sur-

tions specified, no one certification appears to dominate the responses.

With respect to the data in Table 8.1, it is of interest to note that none of the responses were from female practitioners. Also, many respondents identified professional associations in which they were involved. As this was not part of the question, these relationships are not displayed.

Sources of training

There are many possible sources of knowledge which may be employed by MAS practitioners in the course of their work. Listed below are nine of these possible sources.

- Formal college education
- Experience in audit and/or tax work before entering MAS practice
- On the job experience in MAS practice
- Other business experience
- Structured programs sponsored by your CPA firm
- Continuing education programs sponsored by the AICPA or state CPA societies
- Continuing education sponsored by other professional organizations (NAA, AMA, APICS, ASM, etc.)
- Continuing education in trade associations or industry groups
- Self-study (any self-scheduled and planned informal learning program)

Respondents were asked to specify the relative importance of each of these nine sources of knowledge. The responses of the firm representatives are shown in Table 8.2. Responses from practitioners are shown in Table 8.3.

Table 8.2

General Knowledge Source - Level of Significance Per Firm Representatives

General Knowledge Source -----	Local -----	Reg'l -----	Nat'l -----	Multi -----
Formal college education (Average 4.5)	4.3	4.4	5.0	4.2
Prior experience in audit or tax (Average 2.8)	3.9	2.4	3.0	1.8
On the job training in MAS practice (Average 4.3)	4.1	4.2	4.6	4.4

Other business experience (Average 3.6)	3.5	3.8	3.4	4.2
Structured training by your CPA firm (Average 2.9)	2.5	2.4	3.4	3.2
Continuing education by AICPA or state CPA societies (Average 2.4)	3.1	2.8	2.6	1.2
Continuing education by other professional organ- izations (Average 2.8)	2.7	3.6	2.6	2.4
Continuing education by trade/industry groups (Average 2.9)	2.6	3.6	2.6	2.8
Self-study (Average 3.0)	3.4	3.3	2.6	2.6

1.0 = Not Significant 3.0 = Moderately Significant 5.0 = Very Significant

Table 8.3

General Knowledge Source - Level of Significance
Per Practitioners

<u>General Knowledge Source</u>	<u>Indiv</u>	<u>Local</u>	<u>Reg'l</u>	<u>Nat'l</u>	<u>Multi</u>
Formal college education (Average 3.1)	3.1	3.0	2.8	3.3	3.2
Prior experience in audit or tax (Average 3.8)	4.0	4.3	3.8	3.6	3.1
On the job training in MAS practice (Average 4.5)	4.2	4.4	4.6	4.6	4.7
Other business experience (Average 3.8)	4.3	3.9	3.9	3.6	3.4
Structured training by your CPA firm (Average 1.9)	1.6	1.8	2.0	2.0	2.3
Continuing education by AICPA or state CPA societies (Average 2.3)	2.7	2.8	2.5	2.1	1.3

Continuing education by other professional organ- izations (Average 2.1)	1.9	2.1	2.0	2.7	1.7
Continuing education by trade/industry groups (Average 2.3)	2.2	2.0	2.1	2.8	2.2
Self-study (Average 3.4)	3.4	3.1	3.5	3.7	3.2

1.0 = Not Significant 3.0 = Moderately Significant 5.0 = Very Significant

An analysis and comparison of the data in Tables 8.2 and 8.3 reveals several interesting items. It appears that firm representatives feel that formal education is of much more importance than do practitioners. Formal education received a score of 4.5 from the firm representatives indicating a high level of significance. Practitioners only scored formal education at 3.1 or moderately significant.

Conversely, practitioners indicated that experience is more significant than did firm representatives. Experience in audit and tax was scored by practitioners at 3.8. Firm representatives scored audit and tax experience at only 2.8. This suggests that practitioners find audit and tax experience much more significant than do the firm representatives.

Other areas of experience (on the job in MAS practice and other business experience) received similar scores from practitioners and firm representatives. Practitioners scored on the job experience 4.5 while firm representatives specified 4.3. Practitioners scored other business experience at 3.8 while the firm representatives averaged 3.6.

Of interest is that firm representatives specified formal education as more significant than any of the experience categories. On the other side, practitioners specified all of the experience categories as more important than formal education. Several of the practitioners wrote comments on their questionnaires emphasizing their points of view. Two of these comments are as follows:

MAS isn't something you can learn in school--must be able to take theoretical and apply to practical situations. Must develop broad knowledge to know positive ramification to other areas. Must keep current via business publications or to what is happening in various areas.

I think my experience of working in industry and starting my own CPA practice has been the most useful tool in MAS. Too often, the accountant's knowledge is limited to no practical experience. If a client is having cash flow problems, the accountant that has not experienced this does not realize the pressures and time that this takes.

Four of the knowledge areas deal with organized continuing education programs. In all four areas, firm representatives scored the training programs as more significant than did the practitioners. This is especially so in the scoring of the individual firm's programs. Firm representatives scored their own firm's presentations as moderately significant at 2.9. The practitioners scored their own firms programs at only 1.9.

One other point of interest is that none of the four organized continuing education program areas received an average score of more than 2.9. This indicates that all these programs were believed to be at most of moderate significance by both firm representatives and practitioners.

A final issue addressed in these figures is the importance of self study programs. The average scores specified by both the firm representatives (3.0) and the practitioners (3.4) are above those given for any continuing education program. This appears to suggest that self study programs are perceived by both firm representatives and practitioners as more significant than organized continuing education programs.

Education degrees

Respondents to the PQ were asked to specify the type of college degrees earned and when these degrees were awarded. Table 8.4 provides a summary of this information. As this data indicates, almost all practitioners held one or more Bachelor's degrees. The percent of respondents holding at least one Master's degree ranges from 17.1% for Local practitioners to 42.6 respondents for Multinational practitioners.

Table 8.4

College Degrees Held

Per Practitioners

College Degrees Held *	Percent of Responses in Each Firm Classification				
	Indiv	Local	Reg'l	Nat'l	Multi
No 4-year degree	3.0%	1.6%	2.2%	-	-
One bachelor's degree only	64.0%	74.2%	67.8%	62.0%	52.5%
One master's degree only	-	1.4%	1.1%	-	-
Two bachelor's degrees only	8.0%	7.1%	3.3%	-	4.9%
One bachelor's and one master's	21.0%	14.1%	24.4%	33.0%	34.4%

Two bachelor's and one master's degree only	1.0%	-	-	-	-
Two master's and one bachelor's degree only	1.0%	1.4%	1.1%	-	8.2%
Two bachelor's and two master's degrees only	2.0%	0.2%	-	5.0%	-

Percent of respondents holding bachelor's degree	97.0%	97.0%	96.7%	100.0%	100.0%
Percent of respondents holding master's degree	25.0%	17.1%	26.7%	38.0%	42.6%
Total number of respondents	100	434	90	21	61

* In addition to the degrees listed, one Multinational and three Local practitioners hold law degrees and one Regional practitioner holds a Ph.D. degree in Behavioral Science.

The areas in which the college degrees were awarded are displayed in Tables 8.5 and 8.6. Since the population from which the respondents were drawn includes only those who are CPAs, it is not surprising to find that the majority of the Bachelor's degrees held are in accounting. Sources of Master's degrees are more diverse with Accounting and Management identified most frequently.

Table 8.5

Bachelor's Degrees Held

Per Practitioners

Percent of Responses in Each Firm Classification

Degree Area	Indiv	Local	Reg'l	Nat'l	Multi	Simple Average*
Accounting	72.6%	80.3%	73.1%	63.6%	71.9%	72.3%
Management	6.2%	2.8%	4.3%	9.1%	1.6%	4.8%
Finance	7.1%	2.4%	1.1%	4.5%	4.7%	4.0%
Marketing	0.9%	1.3%	-	-	1.6%	0.7%
Statistics/Quantitative Methods	-	0.4%	-	-	-	0.1%
Other Business	0.9%	1.3%	3.2%	-	3.1%	1.7%

Economics	3.5%	4.1%	7.5%	4.5%	3.1%	4.5%
Industrial Engineering	-	0.6%	2.2%	-	-	0.6%
Other Engineering	1.8%	0.4%	1.1%	9.1%	1.6%	2.8%
Liberal Arts	4.4%	2.6%	-	4.5%	6.3%	3.6%

Physical Sciences	1.8%	0.9%	4.3%	-	3.1%	2.0%
Agriculture Science	-	0.2%	1.1%	-	-	0.2%
Mathematics	-	0.6%	2.2%	-	3.1%	1.2%
Other	0.9%	1.1%	-	-	-	0.4%

Number of B.S. degrees held 113 462 93 22 64

*This is a simple average of the five firm classification scores.

Table 8.6

Master's Degrees Held

Per Practitioners

Percent of Responses in
Each Firm Classification

Degree Area	Indiv	Local	Reg'l	Nat'l	Multi	Simple Average*
Accounting	26.9%	46.2%	43.5%	33.3%	28.6%	35.7%
Management	30.8%	28.2%	30.4%	22.2%	28.6%	28.0%
Finance	7.7%	5.1%	4.3%	11.1%	28.6%	11.4%
Marketing	-	3.8%	-	11.1%	-	3.0%
Statistics/Quantitative Meth	-	1.3%	8.7%	-	-	2.0%
Other Business	19.2%	5.1%	4.3%	-	3.6%	6.5%
Economics	-	2.6%	-	11.1%	-	2.7%
Industrial Engineering	-	-	4.3%	-	-	0.9%
Other Engineering	-	-	-	-	3.6%	0.7%
Tax	3.8%	6.4%	-	-	-	2.1%
Behavioral Sciences	-	-	4.3%	-	-	0.9%
Physical Sciences	3.8%	-	-	-	-	0.8%
Agriculture Science	-	-	-	-	-	0.0%
Mathematics	-	-	-	-	3.6%	0.7%
Other	7.7%	1.3%	-	11.1%	3.6%	4.7%

Number of Master's degrees 26 78 23 9 28

*This is a simple average of the five firm classifications scores.

One interesting issue is the length of time between degrees for those practitioners with multiple degrees. As shown in Table 8.7, those practitioners holding two Bachelor's degrees usually earned the two degrees within a very short period of time. All of the Regional and Multinational practitioners earned both degrees at the same time as did a majority of the Local practitioners.

Table 8.7

Length of Time (in years) Between Degrees

Per Practitioners

	Indiv	Local	Reg'l	Nat'l	Multi
Bachelor's (1), Bachelor's (2)					
Number of responses	8	31	3	-	3
Years between degrees:					
Average	1.6	1.7	0	-	0
Median	3	0	0	-	0
High	5	12	0	-	0
Low	0	0	0	-	0
Bachelor's (1), Master's (1)					
Number of responses	21	61	22	7	21
Years between degrees:					
Average	7	4.2	5.7	7.7	3.7
Median	4	3	4	10	2
High	26	13	31	12	11
Low	1	0	1	2	1
Bachelor's (1), Master's (1) Master's (2)					
Number of responses	1	6	1	-	5
B.S. (1) and M.S. (1)					
Years between degrees:					
Average	2	6.5	3	-	3.4
Median	2	4 - 7	3	-	2
High	2	16	3	-	6
Low	2	2	3	-	2
M.S. (1) and M.S. (2)					
Years between degrees:					
Average	2	2	10	-	6.2
Median	2	0	10	-	5
High	2	8	10	-	11
Low	2	0	10	-	3

Practitioners holding a Bachelor's and a Master's degree ranged from 3.7 to 7.7 years between degrees. All of the practitioners holding one Bachelor's and one Master's degree earned the Bachelor's degree first.

Several of the practitioners hold multiple Bachelor's or Master's degrees. Thirteen practitioners hold one Bachelor's and two Master's degrees. The one individual practitioner took two years between the Bachelor's and first Master's degrees and

six Local practitioners took from three to seven years to earn the Master's degree after obtaining the Bachelor's degree. However, these four practitioners earned both Master's degrees at the same time. One Local practitioner took only two years beyond the Bachelor's degree to earn the first Master's degree. Obtaining the second Master's degree took an additional eight years. The sixth Local practitioner took 16 years to earn the first Master's degree but only 4 additional years to earn the second Master's degree.

The Regional and Multinational practitioners holding a Bachelor's and two Master's degrees took a relatively short time beyond the Bachelor's to earn the first Master's degree (2 to 6 years). These same practitioners required a longer period of time (3 to 11 years) to earn the second Master's degree.

Five other practitioners hold multiple Bachelor's and/or Master's degrees. The order in which these degrees were obtained and the length of time between obtaining each succeeding degree is shown below.

BS(1)	2 yrs.	MS(1)	9 yrs.	BS(2)		
BS(1)	0 yrs.	BS(2)	7 yrs.	MS(1)	0 yrs.	MS(2)
BS(1)	0 yrs.	BS(2)	1 yr.	MS(1)	7 yrs.	MS(2)
BS(1)	0 yrs.	MS(1)	2 yrs.	BS(2)	0 yrs.	MS(2)
BS(1)	5 yrs.	MS(1)	0 yrs.	MS(2)	3 yrs.	BS(2)

Improving academic training for MAS

Firm representatives were asked what would they suggest if they could suggest alternatives to the college curriculum in an attempt to better train graduates for MAS practice. Respondents were asked to indicate if more training, no change in training, or less training is needed in each of the following nineteen discipline areas.

- General business training
- Management
- Marketing
- Finance
- Statistics and quantitative methods
- Economics
- Entrepreneurship
- Financial Accounting
- Managerial Accounting
- Information Systems
- Tax
- Audit
- Internship experience
- Computer technology training
- Administrative and management skills
- Communication skills
- Interpersonal skills
- Liberal arts training
- Advanced degrees

Table 8.8

**Academic Education - Suggested Changes in Curriculum
Per Firm Representatives**

Academic Areas -----	Local -----	Reg'l -----	Nat'l -----	Multi -----
General Business Training (Average 3.9)	4.1	3.9	3.8	3.7
Management (Average 4.1)	4.1	3.7	4.6	3.8
Marketing (Average 3.4)	3.6	3.5	3.8	2.8
Finance (Average 3.7)	3.6	3.7	4.2	3.2
Statistics & Quantitative (Average 3.2)	3.2	3.6	2.6	3.4
Economics (Average 3.1)	3.3	3.1	2.6	3.4
Entrepreneurship (Average 4.1)	4.0	4.3	4.2	3.8
Financial Accounting (Average 3.4)	3.4	3.4	3.4	3.2
Managerial Accounting (Average 4.0)	3.8	3.9	4.2	4.0
Information Systems (Average 4.5)	4.3	4.7	4.2	4.6
Tax (Average 3.0)	3.4	2.9	3.4	2.1
Audit (Average 2.9)	3.3	3.0	3.0	2.3
Internship Experience (Average 3.8)	4.1	4.2	3.4	3.4
Computer Training (Average 4.3)	4.4	4.8	3.0	4.8
Administrative and Management Skills (Average 4.0)	3.9	4.0	4.6	3.6
Communication Skills (Average 4.7)	4.7	4.9	4.6	4.6
Interpersonal Skills (Average 4.7)	4.4	4.6	5.0	4.8
Liberal Arts Training (Average 3.0)	3.4	3.4	2.2	3.0
Advanced Degrees				

(Average 3.2)

3.1

3.5

2.6

3.4

1.0 = Not Significant 3.0 = Moderately Significant 5.0 = Very Significant

From the data in Table 8.8, the discipline areas which firm representatives expressed the most interest in additional training are not technical skills, but communication and interpersonal skills. These two areas both received an average score of 4.7. The technical area receiving the most support for additional academic training is information systems (4.5).

Several areas received average scores around 4.0 indicating support for some additional training. Computer technology training (4.2), Management (4.1), Entrepreneurship (4.1), Management Accounting (4.0), Administrative and Management Skills (4.0), General Business Training (3.9), Internship Experience (3.8), and Finance (3.7) all appear to be academic areas in which some additional training is desired.

The remaining academic areas received scores around 3.0 indicating no desired change in the academic curriculum with respect to these areas. Of interest is that none of the academic areas received an average score supporting reduced emphasis in the academic curriculum.

Summary and conclusions

This chapter examined the training and education of MAS practitioners. Six basic issues were discussed. Each of these issues will be briefly summarized.

The first issue concerned the availability of direct entry into MAS practice. Direct entry into MAS practice without audit experience is common for all National and Multinational firms, 57% of the Regional firms, and only 23% of the Local firms.

A second issue was the primary training of MAS practitioners. The data indicated that smaller firms use a higher percentage of individuals trained primarily in accounting than do the larger firms. The larger firms use MAS people trained both in accounting and in other disciplines.

A third issue concerns the professional certifications held by practitioners other than the CPA. Of the 714 practitioners questioned, 50 (7%) held non-CPA certifications. Certified Data Processor, Certified Information Systems Auditor, and Certified Management Accountant were the most prevalent additional certifications.

The fourth issue was the source used by MAS practitioners to gain general knowledge for their practice. From a list of possible sources shown in Figure 8.1, firm representatives identified formal college education and on-the-job training in

MAS practice as the most significant areas. MAS practitioners identified on-the-job training as the most significant area.

As least significant sources of general knowledge, firm representatives specified continuing education programs by the AICPA or state CPA societies. Practitioners specified structured training by their CPA firm and continuing education programs by other professional organizations as the least significant areas for gaining general knowledge.

A fifth issue was the level of education held by MAS practitioners. All 714 responding MAS practitioners held at least a Bachelor's degree. The majority (72.3%) of these Bachelor's degrees were in Accounting. Master's degrees become more prevalent as firm size increases. Of the Multinational practitioners, 42% hold at least one Master's degree. The majority of these Master's degrees (81.6%) are in business areas with Accounting (35.7%), Business Management (28%), and Business Finance (11.4%) most prevalent.

The sixth issue concerned suggested changes in college curriculum. Firm representatives were asked to indicate those areas of a college education which needed more or less emphasis (see Table 8.2). Communication and interpersonal skills were identified as the areas in which educational programs needed to concentrate. No educational area was identified as needing less attention.

Chapter 9

PRACTITIONER CAREER PATHS

Prior studies have indicated that an impressive variety of career paths lead to success in MAS work. Data from the PQ further confirms the variety of backgrounds that MAS practitioners bring to their careers. This section will examine the different career paths reported by PQ respondents.

In analyzing the responses, four basic career paths emerged which lead to current MAS positions. These four general career paths are 1) advancement strictly within the specific CPA firm size (firm advancement), 2) advancement within various-sized CPA firms (CPA industry advancement), 3) interruption of progress within the CPA industry to pursue a non-CPA career and then a return to the CPA industry (interrupted advancement), or 4) initial entrance of the CPA industry after spending some time in a non-CPA position (non-CPA entrance). These four general career paths will be used to examine data from each of the five firm classifications.

It is important to note that rather than a full career history of the respondent, the PQ only requested information covering the last five significant positions in the individual's career. Therefore, some of the responses cannot be fully traced back to the time of the respondent's entry into the job market.

The Individual firm practitioner

The Individual firm is typically composed of one owner who manages one or, possibly, two offices. The owner is the sole proprietor, but may employ a number of support staff and managerial help. Some fraction of the firm's employees will usually be CPAs. In the Individual firm, the owner is generally in charge of any MAS practice. One hundred owners responded to the PQ of which 93 specifically answered questions concerning their career path. The summarized results of these 93 responses are broken down into the four different career paths and presented in Table 9.1.

TABLE 9.1
CAREER PATHS
INDIVIDUAL FIRM PRACTITIONERS
SUMMARIZED RESPONSES

INDIVIDUAL FIRM ADVANCEMENT		Average Years in Each Position		
Number of responses	4			
Percent of Total Responses	4.3%			
		CPA Staff	CPA Manager	Indiv Owner
		3.0	3.8	9.8

CPA INDUSTRY ADVANCEMENT

Number of responses 46
 Percent of Total Responses 49.5%

Average Years in Each Position			
CPA Staff	CPA Manager	CPA Partner	Indiv Owner
4.1	2.2	2.2	6.0

INTERRUPTED ADVANCEMENT

Number of responses 24
 Percent of Total Responses 25.8%

Average Years in Each Position				
CPA Staff	Non-CPA	CPA Manager	CPA Partner	Indiv Owner
3.7	5.9	0.5	0.7	3.9

NON-CPA ENTRANCE

Number of responses 19
 Percent of Total Responses 20.4%

Average Years in Each Position				
Non-CPA	CPA Staff	CPA Manager	CPA Partner	Indiv Owner
6.8	1.9	0.9	0.9	7.7

Individual firm advancement. Data from the survey would suggest that the number of professionals who begin staff work in an Individual firm size and then proceed to advance within that environment, finally owning a firm offering MAS, is extremely limited. Only four of the 93 responses followed such a career path. As indicated in Table 9.1, the average number of years these four owners spent in staff and managerial positions were 3 and 3.8 years, respectively. Compared to the other career paths, this is the fastest approach to becoming an individual practitioner.

CPA industry advancement. The most common career path of the 93 respondents was to work in different sizes of CPA firms. Forty-six of the respondents fell into this category. Several trends appear from this data. One trend is that a significant number of these 46 owners did not spend time as managers or partners in other firms. However, the respondents who had only staff experience before owning an individual practice usually spent more time than the 4.1 year average.

Another point to be noted is that there is no indication that experience in one size of firm is preferred over another in preparation for an MAS career in a Individual firm. There seems to be an even spread of experience in larger and smaller firms among the 46 owners.

Interrupted advancement. Of the 93 owners of individual firms, 24 responded that they had interrupted their public accounting career to pursue non-CPA firm positions. As might be expected, the majority of these professionals spent their non-CPA time in controller or financial officer positions. There is great variety in the time these professionals worked outside of public accounting, ranging from 2 to 20 years. There is, however, substantial similarity in the years of CPA experience prior to leaving public accounting. Generally, the professional spent 3 to 4 years in a staff position with any one of the 4 types of accounting firms before moving to a non-CPA position.

Most of these MAS practitioners began their own practice immediately at the conclusion of work in the non-CPA field. Those few practitioners who did return to a larger firm before beginning an individual practice had a relatively brief non-CPA experience--between 2 to 5 years.

Non-CPA entrance. Nineteen of the ninety-three owners of Individual firms apparently began their professional career in positions outside of public accounting. Some of these owners subsequently spent some time in various CPA firms before beginning their individual practice. Again the reader is reminded that the PQ only requested information on the last five positions of the MAS practitioner. It is possible that a few of these professionals were employed in public accounting prior to the time spent in a non-CPA position.

One trend to be noted is that as time spent in non-CPA firm work increases, the time spent by these professionals working in larger CPA firms before beginning their individual practice decreases. For example, those practitioners who worked 7 years or longer in non-CPA positions spent an average of 2.4 years in larger CPA firms before moving to their Individual firm. This is in contrast to those practitioners who worked less than seven years in a non-CPA position who spent an average of 4.6 years in non-individual CPA firms before beginning their own individual practice.

Another point of interest is in comparing the non-CPA firm position held by those who began their careers outside public accounting and those who interrupted their CPA advancement. There appears to be a much greater diversity in the type of non-CPA firm position held by those who began outside of public accounting. More specifically, there is a decrease in the number of controller and financial officer positions held by non-CPAs compared to those held by CPAs who temporarily left public accounting. Additionally, the average time non-CPAs spent in non-CPA positions before entering public accounting is greater than the time CPAs spent in non-CPA positions during the interruption of their public accounting career.

The Local firm practitioner

The PQ surveyed 441 professionals in Local firms of which 395 completed the section on career paths. Of these 395 respondents, 21 of them are currently in managerial positions. The remaining 374 Local professionals are partners. The results of those 395 responses are presented in Table 9.2.

TABLE 9.2
CAREER PATHS
LOCAL FIRM PRACTITIONERS
SUMMARIZED RESPONSES

LOCAL FIRM ADVANCEMENT		Average Years in Each Position				
Number of Responses	Percent of Total Responses	Local Staff	Local Manager	Local Partner		
120	30.4%	5.5	1.0	8.3		
		8.3	2.9			
CPA INDUSTRY ADVANCEMENT		Average Years in Each Position				
Number of Responses	Percent of Total Responses	Non-Local CPA Firms	Local Staff	Local Manager	Local Partner	
174	44.1%	5.7	1.4	0.5	6.7	
		8.0	4.5	6.0		
INTERRUPTED ADVANCEMENT		Average Years in Each Position				
Number of Responses	Percent of Total Responses	Non-Local CPA Firms	Non-CPA	Local Staff	Local Manager	Local Partner
41	10.4%	3.9	2.9	1.1	0.7	5.1
		4.3	4.8	0.7	4.3	
INTERRUPTED ADVANCEMENT (WITHIN LOCAL FIRMS ONLY)		Average Years in Each Position				
Number of Responses	Percent of Total Responses	Local Staff	Non-CPA	Local Manager	Local Partner	
11	2.8%	4.3	3.7	0.2	5.9	
		5.0	13.0	20.0		
NON-CPA ENTRANCE		Average Years in Each Position				
Number of Responses	Percent of Total Responses	Non-Local CPA Firms	Non-CPA	Local Staff	Local Manager	Local Partner
19	4.8%	6.9	4.5	0.6	0.3	6.3

		2.0	9.0	0.0	3.0
NON-CPA ENTRANCE (WITHIN LOCAL FIRMS ONLY)		Average Years in Each Position			
Number of Responses	30	-----			
Percent of Total Responses	7.6%	Non-CPA	Local Staff	Local Manager	Local Partner

Average years in position		6.1	3.3	0.7	9.1
		3.5	8.5	3.5	

Local firm advancement. A large number of professionals within Local firms developed their MAS career without spending time in other sizes of CPA firms or in non-CPA positions. The 120 responses in Table 9.5 represented 114 partners and 6 managers. As indicated, those professionals in a partnership advanced through managerial positions at an average rate of only one year in management. This rate is quite rapid when compared later in this report with that of partners of larger firms.

CPA industry advancement. Like MAS practitioners in Individual firms, the most common career path for MAS practitioners in Local firms (174/374) was some type of advancement through various sizes of CPA firms. There is no indication that experience in one size of firm is preferred over another in preparation for an MAS career in a Local firm. It would seem that the professional will often enter directly into the position of partner in a Local firm after spending substantial time in other sizes of firms.

Interrupted advancement. The number of professionals who have interrupted their CPA employment for non-CPA experience is relatively small in comparison to those who remain solely in public accounting. Of the 395 respondents, only 101 MAS professionals had any type of non-CPA experience within their last five career positions. Of these 101 MAS professionals with non-CPA experience, 52 interrupted their CPA employment for non-CPA positions. The data for these 52 positions has been broken down into two subsections: those professionals leaving and returning specifically to a Local firm and those professionals with somewhat more general movement within various sizes of CPA firms.

It is interesting to note that after the respondent's return to CPA work, little if any time is spent in staff or managerial positions before advancement to a partnership. In some firms, this non-CPA experience seems to be a justified substitute for the staff, manager, partner advancement scheme normally employed for most top positions in a CPA firm. However, never does a MAS professional achieve a significant position in a firm based solely on non-CPA experience. There is generally some combination of four to six years in non-partner CPA positions before the advancement to partnership. Generally, the amount of time spent to become an MAS partner is eight to ten years.

Non-CPA entrance. Of the 101 Local respondents with non-CPA experience, 49 began their careers outside of public accounting. The career paths of these professionals are broken down to those entering and moving through various sizes of CPA firms before entering Local practice and those entering the CPA industry and advancing solely within Local firms.

Professionals whose career paths started outside of public accounting and then among various sizes of CPA firms, after an average of 4.5 years in a non-CPA position and 6.9 years in other types of CPA firms, spent little time in staff or managerial positions in the Local firm before assuming a partnership. Logically, those with direct entrance into the Local firm without any other experience in CPA work spent increased time in Local non-partner positions. Overall, those with CPA experience in non-Local firms came into a partnership about one year later than those whose CPA experience was confined strictly to Local firms. A final point to be made in comparing the career paths of interrupted advancement and non-CPA entrance is that those practitioners who began work in the CPA industry, left, and returned again have attained their present position two to four years quicker than those who initially entered public accounting after a non-CPA firm position.

The Regional firm practitioners

Ninety-one MAS professionals in Regional firms responded to the PQ. Of these, 79 returned usable career path information. These 79 MAS professionals are composed of 75 partners and 4 managers. A summary of their careers is presented in Table 9.3.

TABLE 9.3
CAREER PATHS
REGIONAL FIRM PRACTITIONERS
SUMMARIZED RESPONSES

REGIONAL FIRM ADVANCEMENT		Average Years in Each Position			
Number of Responses	27	-----			
Percent of Total Responses	34.2%	Reg'l Staff	Reg'l Manager	Reg'l Partner	
		4.7	2.3	6.4	
		3.0	10.0		
CPA INDUSTRY ADVANCEMENT		Average Years in Each Position			
Number of Responses	28	-----			
Percent of Total Responses	35.4%	Non-Reg'l CPA Firms	Reg'l Staff	Reg'l Manager	Reg'l Partner

 8.8 0.5 1.7 3.9

INTERRUPTED ADVANCEMENT

Number of Responses	13	Average Years in Each Position				
Percent of Total Responses	16.5%	-----				
		Non-Reg'l CPA Firms	Non-CPA	Reg'l Staff	Reg'l Manager	Reg'l Partner
		7.3	4.3	0.2	0.7	6.4
		6.0	3.2	0.0	2.3	

NON-CPA ENTRANCE

Number of Responses	11	Average Years in Each Position			
Percent of Total Responses	13.9%	-----			
		Non-CPA	Reg'l Staff	Reg'l Manager	Reg'l Partner
		6.3	3.4	2.4	7.0

Regional firm advancement. The proportion of respondents who advanced to partner and managerial positions by staying within the same-sized firm is roughly equivalent in both Local and Regional firms. About 30% of these MAS professionals have had no other experience than that found within Regional CPA firms. Also note that the time spent in managerial positions with Regional firms (2.3 years) is more than double that of Local firms (1 year).

CPA industry advancement. Data was collected on 28 MAS professionals with experience in various types of CPA firms. As these professionals move within the CPA industry, it is difficult to discern that experience in one size of CPA firm has any advantage in the development of a MAS career. Yet one possible conclusion is that time spent only in an Individual practice might be insufficient for a partnership in a Regional firm. For example, none of the 28 Regional professionals have had experience only in an Individual practice.

Interrupted advancement. Career path data for 13 Regional practitioners who interrupted their CPA employment to work in a non-CPA position was collected. It appears that as the firm size increases, the time it takes for an MAS professional to become a partner also increases. The data shows that after significant time in non-Regional firms and in a non-CPA position, the MAS partner spent little or no time in non-partner positions with Regional firms. This trend closely resembles that of partners with similar career paths found in the Local firm. However, the total time spent before these Regional professionals became partners increased roughly two years over that of Local professionals.

Non-CPA entrance. A unique aspect of the 13 Regional practitioners with non-CPA entrance to Regional firms is that the respondents had CPA experience only in Regional firms. About half of these professionals did not spend time in managerial positions before becoming partners. However, it is impossible to discern from the limited responses to the PQ if there is any relationship between particular non-CPA positions held and the jump in advancement directly from staff to partner. One possible reason for this jump may be that the experience in private industry and manufacturing involved work as a controller.

The National firm practitioner

There were few respondents (only 21) that indicated current CPA work in a National firm. Seventeen of these twenty-one practitioners provided information on their career paths. A summary of the responses are given in Table 9.4.

TABLE 9.4
CAREER PATHS
NATIONAL FIRM PRACTITIONERS
SUMMARIZED RESPONSES

NATIONAL FIRM ADVANCEMENT		Average Years in Each Position		
Number of Responses		Net'l Staff	Net'l Manager	Net'l Partner
6				
Percent of Total Responses	35.3%	3.8	3.8	5.8

CPA INDUSTRY ADVANCEMENT		Average Years in Each Position			
Number of Responses		Non-Nat'l CPA Firms	Net'l Staff	Net'l Manager	Net'l Partner
8					
Percent of Total Responses	47.1%	6.3	4.0	0.9	2.1
		12.1	0.8	1.9	

INTERRUPTED ADVANCEMENT		Average Years in Each Position			
Number of Responses		Non-Nat'l CPA Firms	Non-CPA	Net'l Staff	Net'l Manager
1					
Percent of Total Responses	5.9%	8.5	4.5	0.0	0.5

NON-CPA ENTRANCE		Average Years in Each Position			
Number of Responses	2	-----			
Percent of Total Responses	11.8%		Nat'l	Nat'l	Nat'l
		Non-CPA	Staff	Manager	Partner

		4.0	0.0	6.0	6.0
		7.0	6.0	1.0	

National firm advancement. Six practitioners advanced with the National Firm category. Total time required for the six partners to attain their position was roughly 7.5 years. This is comparable to similar advancement of practitioners in non-National CPA firms.

CPA industry advancement. Data was collected from four partners and four managers who advanced through the CPA industry to their current positions. These practitioners came from both smaller and larger CPA firm classifications, and took an average of 11.2 years to make partner. This is significantly longer than the time taken by those who progressed straight through the National firm classification.

Interrupted advancement and non-CPA entrance. There were only three responses under these two categories. With the small number of responses, no generalizations can be made.

The Multinational firm practitioner

Sixty-one practitioners in Multinational firms responded to the PQ. Of those respondents, 57 completed the section on career paths. Of those 57, 23 were managers and 34 were partners. The summarized results of those 57 answers are presented in Table 9.5.

TABLE 9.5
CAREER PATHS
MULTINATIONAL FIRM PRACTITIONERS
SUMMARIZED RESPONSES

MULTINATIONAL FIRM ADVANCEMENT		Average Years in Each Position		
Number of Responses	26	-----		
Percent of Total Responses	45.6%	Multi	Multi	Multi
		Staff	Manager	Partner

		5.5	4.5	3.4
		7.0	3.5	

CPA INDUSTRY ADVANCEMENT

Number of Responses	6	Average Years in Each Position			
		Non-Multi CPA Firms	Multi Staff	Multi Manager	Multi Partner
Percent of Total Responses	10.5%	7.5	2.5	0.0	2.3
		2.0	2.0	3.5	

INTERRUPTED ADVANCEMENT

Number of Responses	7	Average Years in Each Position			
		Non-Multi CPA Firms	Non-CPA	Multi Manager	Multi Partner
Percent of Total Responses	12.3%	4.0	5.0	3.0	2.0
		4.3	4.5	3.3	

NON-CPA ENTRANCE

Number of Responses	3	Average Years in Each Position			
		Non-CPA Non-CPA	Non-Multi CPA Firms	Multi Staff	Multi Manager
Percent of Total Responses	5.3%	3.5	3.3	1.7	2.7

NON-CPA ENTRANCE (WITHIN MULTINATIONAL FIRMS ONLY)

Number of Responses	15	Average Years in Each Position			
		Non-CPA	Multi Staff	Multi Manager	Multi Partner
Percent of Total Responses	26.3%	5.4	2.4	4.0	1.8
		6.0	1.8	3.9	

Multinational firm advancement. Of the 26 practitioners in Table 9.5 whose advancement came strictly within Multinational firms, 22 are partners and 4 are managers. The important trend to notice is that the time required become a partner increases as the firm size increases. MAS practitioners in Individual, Local, Regional, and National firms averaged 6.5 to 7.6 years to make partner. The MAS practitioners in the Multinational firms averaged 10 years to make partner.

CPA industry advancement. The information collected indicates that there is some flexibility in developing a substantial position in a Multinational firm. Of the four respondents who were partners, three entered directly into partnership after extended experience in lesser firms. Perhaps with more data,

more practitioners would have indicated greater experience in Multinational positions prior to a partnership.

Interrupted advancement. All of the seven respondents who interrupted their CPA career for non-CPA firm work spent their CPA time solely with Multinational firms. None had experience in smaller firms except in non-CPA work, but, without more data, it is difficult to determine any trends.

Non-CPA entrance. Three of the eighteen practitioners who initially began their career in non-CPA positions spent time in smaller CPA firms before moving into Multinational firms. The remaining 15 practitioners are non-CPAs who entered directly into Multinational firms. The 15 practitioners who entered directly into Multinational firms spent an average of 5.5 to 6 years in non-CPA work before moving to the CPA industry. Of these 15 respondents, the 10 practitioners in managerial positions spent an average of eight years moving to that position. The remaining five practitioners in partner positions spent an average of 12 years moving to their positions.

Summary and conclusions

In reviewing career paths followed by MAS practitioners in all five types of CPA firms, it appears that the fastest avenue of advancement to the position of partner is by advancement within the specific CPA firm size. However, only 183 of the total 714 MAS practitioners followed this pattern.

Two hundred and sixty-two MAS practitioners advanced to their current position through various-sized CPA firms, making this advancement scheme the most common career path followed by the PQ respondents. Additionally, this particular career path generally had a faster advancement rate than career paths involving non-CPA positions.

Tremendous diversity both in time spent in achieving positions and in position types is found in the career paths of the remaining 269 respondents who were employed in various non-CPA positions at some point in their career. This diversity precludes the possibility of singling out any particular non-CPA advancement scheme that qualifies as a "best approach" to an MAS position.

Finally, as indicated in the introduction of this section, there is a tremendous variety of career paths leading to current MAS positions. This variety will continue to generate individual approaches to a successful MAS career and support many MAS specialists in diverse areas of business.

Chapter 10

ENTRY INTO MAS PRACTICE

A number of career paths taken by individuals in MAS practice were examined in Chapter 9. This chapter will examine the growth of MAS practice over a ten-year period, the number of new MAS practitioners expected over a five-year period, the entry level of new MAS practitioners and the source of new MAS staff.

Growth in MAS practice

Respondents to the FQ were asked to indicate the actual and expected change in the size of their MAS practice (in terms of billing revenues and hours) over the periods 1979-1983 and 1984-1988. Table 10.1 displays the responses for 1979-1983 while Table 10.2 displays 1984-1988.

Table 10.1

Change in MAS Practice 1979-1983

Per Firm Representatives

Percent of Responses Within Each Firm Classification

Percent Change	Local	Reg'l	Nat'l	Multi
-62%	4%	-	-	-
-32%	4%	-	-	-
0 - 10%	23%	13%	-	-
11 - 20%	8%	13%	-	10%
21 - 30%	11%	-	50%	-
31 - 40%	-	-	-	-
41 - 50%	7%	4%	25%	20%
51 - 60%	4%	-	-	-
61 - 70%	8%	4%	-	-
71 - 80%	4%	-	-	30%
81 - 90%	-	-	-	-
91 - 100%	19%	16%	-	-
101 - 125%	-	-	-	20%
126 - 150%	-	4%	-	-
200%	-	4%	25%	20%
250%	-	4%	-	-
300%	4%	8%	-	-
330%	-	8%	-	-
400%	-	4%	-	-
500%	4%	-	-	-
600%	-	4%	-	-
1000%+	-	4%	-	-

Average Change	64%	187%	76%	96%
Median Change	30%	100%	30% - 50%	75% - 80%
Number of Responses	27	24	4	10

Table 10.2

Change in MAS Practice 1984-1988

Per Firm Representatives

Percent of Responses Within Each Firm Classification

Percent Change	Local*	Reg'l	Nat'l	Multi
0 - 10%	19%	11%	20%	-
11 - 20%	9%	11%	-	10%
21 - 30%	9%	4%	40%	10%
31 - 40%	6%	-	-	-
41 - 50%	16%	7%	-	-
51 - 60%	3%	4%	-	10%
61 - 70%	-	-	-	10%
71 - 80%	3%	-	20%	-
81 - 90%	3%	-	-	-
91 - 100%	9%	21%	20%	30%
101 - 110%	3%	-	-	-
120%	-	-	-	10%
150%	3%	4%	-	10%
200%	6%	7%	-	10%
300%	6%	14%	-	-
400%	-	4%	-	-
500%	-	7%	-	-
700%	3%	-	-	-
750%	-	4%	-	-
1000% +	-	4%	-	-
Average Change	92%	206%	48%	91%
Median Change	50%	100%	30%	95%-100%
Number of Responses	32	28	5	10

*Total does not sum to 100% due to rounding.

Local firms indicated an average growth of 64% for the five-year period 1984-1988. During these two five-year periods, 27% of the firms actually grew by 100% or more in the first five

years and 33% expect to grow by at least 100% or more from 1984 to 1988.

Regional firms appear to be most affected by the change in MAS practice. Growth from 1979 to 1983 averaged a 187% increase per firm with 57% of the firms reporting at least a 100% growth. Expectations for 1984-1988 are for an average growth per firm of 206% with 65% of the firms anticipating at least 100% growth.

National firms indicate an average growth of 76% and 48% for the periods 1979-1983 and 1984-1988 respectively. Only 25% and 20% of the firms experienced and expected growth of at least 100% during these two periods of time.

Multinational firms indicate an average growth of 96%, with 40% of the firms at least 100%, for the 1979-1983 period. During the 1984-1988 period, average growth is expected to be 91% with 50% of the firms anticipating at least 100% growth.

Number of new MAS practitioners

In examining the responses, it appears that the most growth is anticipated by those firms which are presently most involved in MAS practice. Table 10.3 indicates the number of new MAS practitioners expected during 1985-1989.

Table 10.3

Number of New MAS Practitioners Expected 1985-1989

Per Firm Representatives

Number of New MAS Practitioners	Number of Responses in Each Firm Classification			
	Local	Reg'l	Nat'l	Multi
1 - 5	20	14	-	-
6 - 10	5	9	-	-
11 - 20	-	4	1	-
21 - 30	-	1	-	-
31 - 50	1	-	-	-
51 - 100	-	-	2	-
101 - 150	-	1	1	1
250	-	-	-	2
300	-	-	1	1
600	-	-	-	1
Over 1000	-	-	-	4
Average Number of New	4.3	11.8	124	1636

MAS Hires Per Firm

Total Number of Responses	26	29	5	9
Total Number of New Hires	112	342	620	14,724

Local firms generally expect to have an average of 4.3 new MAS practitioners over the period 1985-1989. One local firm expects to hire 30 new practitioners during the period. Regional firms expect to hire an average of 11.8 new practitioners while National and Multinational firms anticipate an average increase of 124 and 1,636 new MAS practitioners respectively.

Level of entry

In addition to specifying the number of new MAS practitioners expected by each firm, firm representatives were asked to identify the level (entry or advanced) at which these new practitioners would enter the firm. Responses to this question are shown in Table 10.4.

Table 10.4

Entry Level Into MAS Practice

Per Firm Representatives

Entry Level	Number of Responses in Each Firm Classification					Advanced Level
	Local	Reg'l	Nat'l	Multi		
100%	10	3	-	-	-	0%
95%	-	-	-	-	2	5%
90%	-	1	-	-	-	10%
80%	2*	-	-	-	-	20%
75%	-	-	-	-	2	25%
70%	-	1	-	-	-	30%
67%	1	-	-	-	-	33%
65%	-	-	-	-	1	35%
60%	-	1	-	-	1	40%
50%	1	2	2	-	-	50%
35%	-	-	-	-	1	65%
33%	-	4	-	-	1	67%
25%	-	3	2	-	2	75%
20%	-	1	-	-	-	80%
17%	-	-	1	-	-	83%
15%	-	1	-	-	-	85%
0%	18	12	-	-	-	100%

Total number of responses	32	29	5	10
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- * For example, two of the Local firms hire 80% of their new employees at the entry level and 20% of the new employees at the advanced level.

From the data displayed in Table 10.4, it appears that Regional and especially Local firms are more restrictive about hiring new MAS staff at either the entry or advanced levels than are the National and Multinational firms. In the Local firm classification, 31% of the responding firms enter new MAS practitioners only at the entry level. Another 56% of the Local firms enter new MAS practitioners only at the advanced level. Only 12% of the Local firms hire new MAS practitioners at both the entry and advanced levels.

The Regional firms are a bit more flexible than the Local firms with 49% of the firms hiring both at the entry and advanced levels. Still, 10% of the Regional firms hire only at the entry level while 41% hire only at the advanced level.

The National and Multinational firms appear to be the most flexible in their entry level for new MAS practitioners. All of the firms responding in these two classifications hire new practitioners at both the entry and advanced level.

Source of new MAS staff

Firm representatives were asked to identify the source of their firm's new MAS staff. This information is summarized in Table 10.5.

Table 10.5

Source of New MAS Staff Per Firm Representatives

Source of New Staff	Local	Reg'l	Nat'l	Multi
New Bachelor's of Business Graduates	18.6%	12.8%	16.0%	4.9%
New Bachelor's of Science Graduates	6.3%	13.5%	4.0%	6.8%
New Bachelor's of Arts Graduates	0.3%	2.0%	1.0%	0.8%
New Master's of Business Graduates	12.9%	7.5%	18.0%	17.5%
New Master's of Science Graduates	0.7%	0.9%	5.0%	10.0%

New Master's of Arts Graduates	-	0.3%	-	1.7%
From Industry	7.6%	25.2%	30.0%	41.2%
From Government	-	2.0%	4.0%	6.2%
From Other Staff Positions	46.0%	30.9%	22.0%	6.5%
Other	7.6%	4.8%	-	4.4%

Total Direct From Education	38.8%	37.1%	44.0%	41.7%
Total From Noneducation Areas	61.2%	62.9%	56.0%	58.3%

Two issues of interest appear in this data. First, less than 50% of new hires are direct from educational programs. This says that the majority of new MAS practitioners are not coming directly from their college education. Of those coming directly from college, Local and Regional firms employ more B.S. graduates while National and Multinational firms employ more M.S. graduates.

Second, as firm size increases, the number of new employees from industry increases. Local firms hire 7.6% of their new employees from industry. Regional firms hire 25.2% of their new hires from industry while National and Multinational hire 30% and 41.2% respectively. Conversely, the larger the firm size, the less the number of new MAS practitioners coming from other staff positions. Local firms indicate 46% of their new MAS staff comes from other positions within the firm. This percentage decreases steadily as firm size increases to a low of 6.5% for Multinational firms.

Summary and conclusions

This chapter has discussed the growth of MAS practice over a ten-year period, the number of new MAS practitioners expected over a five-year period, the entry level of new MAS practitioners and the source of new MAS staff.

All of the firm classifications indicated growth in MAS practice for the period 1979-1983, ranging from 64% for Local firms to 187% for Regional firms. During the period 1984-1989, expected growth in MAS practice revenues ranges from an increase of 48% for National firms to 200% for Regional firms.

For the period 1984-1989, the average number of new MAS hires per firm is as follows: Local firms, 4 individuals;

Regional firms, 12 individuals; National firms, 124 individuals; and Multinational firms, an average of 1,636 individuals.

Of the Local firms responding to this study, 56% hire new MAS practitioners only at the advanced level while 31% hire only at the entry level. Of the responding Regional firms, 41% hire new MAS practitioners only at the advanced level, while 10% hire only at the entry level. The remaining Local and Regional firms, as well as all of the National and Multinational firms, hire new MAS professionals at both the entry and advanced levels.

The majority of new MAS hires are from other employment positions. As firm size increases, the number of new MAS hires from industry increases from 7.6% for Local firms to 41.2% for multinational firms. As firm size increases, the number of new MAS hires from other positions within the firm (audit and tax staff) decreases from 46% for Local firms to 6.5% for Multinational firms.

The responding CPA firms expect to hire 31% to 44% of new MAS hires directly from college. Of these new college hires, Local and Regional firms employ a majority of new employees with a bachelor's degree. National and Multinational firms employ a majority with Master's degrees.

**An AICPA Report
on Management
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Bibliographic References for Management Advisory Services

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ACKNOWLEDGEMENTS

We acknowledge the pioneering work done by Edward L. Summers and Kenneth E. Knight in the American Institute for Certified Public Accountants publication of Management Advisory Services by CPA's, the MASBOKE study in 1976. This work is intended as a bibliographic update to that publication.

In most topic areas the references selected are from those published within the last four years. In a few instances references older than four years are included because they are standards in the area. We have, however, attempted to avoid duplication with the 1976 MASBOKE study (cited above), and therefore recommend that interested readers review that work as well.

We acknowledge the sponsorship, editorial guidance, and input from the MAS Education and Information Subcommittee of the AICPA in the preparation of this report and in conducting the entire MASPAK study. This work would not have been possible without the subcommittee involvement. Particular recognition is appropriate for Jackie Babicky, Gregson Parker, Dick Savich, Murray Klein, and Gene Temkin for their significant guidance and encouragement. We also express appreciation to Monroe S. Kuttner and Monte Kaplan of the AICPA MAS Division for their assistance.

MAS PRACTICE AND KNOWLEDGE--SELECTED BIBLIOGRAPHIC REFERENCES

This bibliography is intended to provide a starting point for studying various aspects and areas of Management Advisory Services (MAS) practice. Obviously, the volume of material written in various MAS related areas is very large. Consequently, we have included only a small selection of references in this monograph. These selections were made in an attempt to provide both quality and breadth of coverage found in recently published volumes. Certainly there are many excellent books published which may not be included in the bibliography.

This bibliography is structured with the following major topic areas:

- Management and Consulting
- Executive Planning, Implementation, and Control
- Systems Concepts, Design, and Implementation
- Finance and Accounting
- Electronic Data Processing
- Operations
- Human Resources
- Marketing
- Management Science
- Office Automation
- Personal Financial Planning
- Instruction and Training
- Investment

At the beginning of these major areas, journals and magazines pertaining to the area are listed. Each topical area is then subdivided into pertinent sections, each of which is generally annotated with a brief description or explanation. References (limited to texts, books, and some monographs) are then given for each section in alphabetical order. Some references appear in more than one section.

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- a. Operations Accuracy and Facilities Security--Administrative, physical, program and data, clerical, and user controls over operations to assure accuracy of EDP services.

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- (2) **Office manpower scheduling**--Peak period scheduling, work load leveling, work sequencing, overtime, and subcontract services scheduling.

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DelMar, D. Operations and Industrial Management: Designing and Managing for Productivity. New York: McGraw-Hill, 1985.

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- c. Customer Order Processing--Receiving and approving orders; shipment date notification and back order control; returned goods authorization; receipt control.

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- f. Manufacturing Engineering Information--Manufacturing bills of materials, tooling, and equipment specification; fabricated parts routings; assembly and process information; make buy decision analysis.

Azadivar, F. Design and Engineering of Production Systems. San Jose: Engineering Press, 1984.

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- g. Materials Control and Handling--Establishing the best methods for storing and transporting materials with the operations facility.

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- (1) Material and component availability--Vendor lead-time checking; projected shortage identification and expediting; scrap control, cycle counting.

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- (2) Materials requisitioning and control--implementing material ordering rules, reorder points, safety stock levels; short-term materials scheduling; requisitioning and updates to master materials plan.

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- (3) Customer service and complaint analysis--Repair or replace decisions, field failure investigation, and product design revision recommendations; field failure reports.

Blanding, W. Practical Handbook of Distribution/ Customer Service. Washington: Traffic Service Corporation, 1985.

4. Important Applications in Operations--Specific knowledge related to certain applications is necessary to complete the operations body of knowledge.

- a. Industrial Engineering and Standards Development--Designing efficient layout of workstations and setting standards and procedures for individual group and performance levels at work stations in the manufacturing plant and in office service operations.

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- b. Office management--Coordinating the various office services including communications, records management, mailing and reproduction, and providing for efficient office furnishings and data handling equipment.
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- a. Responsibility Levels Other Than Executive--Policy areas affecting non-managerial and lower to middle managerial employees.

- (1) Human resources requirements forecasting--Organizational goal and objective implications for human resources requirements; preparation and use of manpower and skills forecasts; forecasting different skills levels requirements (e.g., executive, specific highly skilled, specific less highly skilled).

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- (2) Hiring practices and programs--Creating or analyzing job descriptions, duties, and skill combinations; developing recruiting programs; determining and comparing qualifications of potential employees for the organization.

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Kirkpatrick, D. L., et al. Selecting and Training First-Line Supervisors. Chicago: Dartnell Corporation, 1980.

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- (4) Wage and salary policy formulation--Anticipating need for wage and salary adjustment; criteria for acceptable adjustment policy; process of developing policy to guide wages and salaries review.

Dobb, M. H. Wages. Westport: Greenwood Press, 1982.

Elements of Strong Base Pay Administration. Scottsdale, Arizona: American Compensation Association and Berea, Ohio: American Society for Personnel Administration, 1981.

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- (5) Employee benefits--Significance of employee benefits in terms of size relative to wages and tax status; actuarial principles and application in calculating insurance and other deferred benefits; financial reporting requirements applying to employee benefits; specific legal restrictions and regulations applying to pension, disability, medical, and leave benefits.

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Cole, K. J. The Headhunters Strategy: How to Make It Work For You. New York: John Wiley & Sons, 1985.

Taylor, A. R. How to Select and Use an Executive Search Firm. New York: McGraw-Hill, 1984.

- (2) Executive compensation--Need for "replacement income" for highly compensated executives; relative dollar, tax, and motivational significance of base salary, bonuses, capital accumulation plans (e.g., stock options), and managerial perquisites; use of survey and statistical techniques to establish valid comparative data; legal regulatory and financial reporting disclosure requirements applying to executive compensation; businessman's understanding of how profit is produced and relation of various incentive plans to profit production.

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Wierers, R. M. Marketing Research. Englewood Cliffs: Prentice Hall, 1984.

- (4) Methods of data collection--Sampling, surveys, interviews, questionnaires, and selection of most appropriate means to obtain the data required.

Erdos, P. L. with assistance by A. J. Morgan. Professional Mail Surveys. Rev. ed. Malabar: Krieger Publishing Co., 1983.

Hartley, R. F., G. E. Prough, and A. B. Flaschner. Essentials of Marketing Research. Tulsa: Penn Well Books, 1983.

Kimneer, T. C., and J. R. Taylor. Marketing Research: An Applied Approach. 2nd ed. New York: McGraw-Hill, 1983.

- (5) Data evaluation, interpretation and projection--Applied to results of marketing research studies and historical data, using statistical techniques.

Brown, F. E. Marketing Research: A Structure for Decision Making. Reading: Addison-Wesley, 1980.

Panati, C. Breakthroughs. Boston: Houghton Mifflin, 1980.

Tull, D. S. and D. I. Hawkins. Marketing Research: Measurement and Method: A Text With Cases. 3rd ed. New York: Macmillan; London: Collier Macmillan, 1984.

- b. Marketing Planning and Control--Techniques, skills, and procedures related to all aspects of planning and controlling marketing activities and the marketing function.

Jain, S. C. Marketing Planning and Strategy. 2nd ed. Cincinnati: South-Western, 1985.

Weidell, L. A. Strategic Marketing Management: An Integrated Approach. Tulsa: Penn Well Publishing Co., 1983.

Pearce, J. A. Strategic Management: Strategy Formulation and Implementation. 2nd ed. Homewood: Richard D. Irwin, 1985.

- (1) Marketing Planning--Processes, techniques, and organization for market planning.

Ries, A. and J. Trout. Positioning: The Battle for Your Mind. 1st ed. rev. New York: McGraw-Hill, 1986.

Urban, G., and J. Nauser. Design and Marketing of New Products. Englewood Cliffs: Prentice-Hall, 1980.

Zoltners, A. A., ed., Marketing Planning Models. Amsterdam; New York: North-Holland Pub. Co. New York, NY: Sole distributors for the U.S.A. and Canada, Elsevier Science Pub. Co., 1982.

- (2) Sales forecasting--Use of models based on time series analysis, regression analysis, exponential smoothing, subjective methods, forecasting new products, evaluation of forecasts; appraising forecast accuracy; use of models to simulate market processes.

Bolt, G. J. Market and Sales Forecasting Manual. Englewood Cliffs: Prentice-Hall, 1982.

Churchill, G. A., Jr. Marketing Research: Methodological Foundations. 3rd ed. Chicago: Dryden Press, 1983.

White, H. R. Sales Forecasting: Timesaving and Profit-Making Strategies That Work - Sales Executive Club of New York. Glenview: Scott, Foresman, 1984.

- (3) Use of sales analysis--By region, product line, and market; by time period to show trend, market share, and product contribution; identifying effects of changing advertising, promotions, price changes, and other variables.

Bolt, G. J. Market and Sales Forecasting Manual. Englewood Cliffs: Prentice-Hall, 1982.

White, H. R. Sales Forecasting: Timesaving and Profit-Making Strategies That Work - Sales Executive Club of New York. Glenview: Scott, Foresman, 1984.

- (4) Marketing strategy formulation--marketing mix decisions on product continuation or change, new product introduction, and timing; use of customer and product profitability analysis to evaluate sales emphasis, promotion, and distribution.

Bonoma, T. V. and B. P. Shapiro. Segmenting the Industrial Market. Lexington: Lexington Books, 1983.

Porter, M. E. Competitive Advantages: Creating and Sustaining Superior Performance. New York: Free Press; London: Collier Macmillan, 1985.

Porter, M. E. Competitive Strategy: Techniques for Analyzing Industries and Competitors. New York: Free Press, 1980.

3. Marketing Operations--Evaluating and sustaining effectiveness of marketing operations including management of the sales force, product promotion, distribution and handling, and understanding government regulations applying to marketing.

- a. Sales Force Management--Policies and procedures for developing and maintaining an effective selling organization for industrial, manufactured, or agricultural products.

Churchill, G. A., Jr., N. M. Ford, and D. C. Walker, Jr. Sales Force Management: Planning, Implementation, and Control. 2nd ed. Homewood: Richard D. Irwin, 1985.

Stanton, W. J. and R. M. Zuskirk. Management of the Sales Force. 6th ed. Homewood: Richard D. Irwin, 1983.

- b. Advertising and Product Promotions--Media advertising, warranties, allowances, customer profiling.

Kincaid, W. M., Jr. Promotion--Products, Services, and Ideas. 2nd ed. Columbus: Charles E. Merrill, 1985.

Stone, B. Successful Telemarketing: Opportunities and Techniques for Increasing Sales and Profits. Lincolnwood: NTC Business Books, 1986.

Urban, G. L., and J. R. Hauser. Design and Marketing of New Products. Englewood Cliffs: Prentice-Hall, 1980.

- c. Product Distribution and Handling--Economics of product handling after manufacture and before sale; getting product prior to delivery; control of product lines.

Michman, R. D., and S. D. Sibley. Marketing Channels and Strategies. Columbus: Grid, 1980.

- Rosenbloom, B. Marketing Channels: A Management View. 2nd ed. Chicago: Dryden Press, 1983.
- Stern, L. W. and A. I. El-Ansary. Marketing Channels. 2nd ed. Englewood Cliffs: Prentice-Hall, 1982.
- (1) Distribution cost accounting and effectiveness--Evaluation of alternative distribution channels including factory, warehouse and sales facility location.
- Eccles, R. G. The Transfer Pricing Problem: A Theory for Practice. Lexington: Lexington Books, 1985.
- Thomas, A. A Behavioral Analysis of Joint-Cost Allocation and Transfer Pricing. Urbana: Stipes Publishing Co., 1980.
- (2) Inventory management and control--Control of finished goods and spare parts for servicing; warehouse management.
- McLeavey, D. W. and S. L. Narasimhan. Production Planning and Inventory Control. Boston: Allyn & Bacon, 1985.
- Plossl, G. W. Production and Inventory Control: Principles and Techniques. 2nd ed. Englewood Cliffs: Prentice-Hall, 1985.
- (3) Product packaging, handling, and storage--As these affect or control the distribution process.
- Anthony, S., Jr. How Packaging Can Improve Manufacturing Operations. New York: AMA Membership Publications Division, American Management Associations, 1983.
- Griffin, R. C., Jr., S. Sacharow and A. L. Brody. Principles of Package Development. 2nd ed. Westport: AVI Publishing Co., 1985.
- Sacharow, S. The Package as a Marketing Tool. Radnor: Chilton Book Co., 1982.
- d. Customer Service--Setting customer service levels; customer service and repair support; warranty and service contract performance.
- Blanding, W. Practical Handbook of Distribution/Customer Service. Washington: Traffic Service Corporation, 1985.
- Lalonde, B. J., and P. H. Zinszer. Customer Service: Meaning and Measurement. Chicago: National Council of Physical Distribution Management, 1976.
- e. Government Regulation--Understanding and complying with major regulations affecting competition and pricing policies of the firm, Sherman Act, Clayton Act, Robins or Putnam Act, antidumping provision of international commerce.
- Kotler, P. Principles of Marketing. 3rd ed. Englewood Cliffs: Prentice-Hall, 1986.
- Weidenbaum, M. L. Business Government, and the Public. 3rd ed. Englewood Cliffs: Prentice-Hall, 1986.
- Welch, J. L. Marketing Law. Tulsa: Petroleum Publishing Company, 1980.

Management Science

Journals

Decision Sciences. Columbia, SC: Decision Sciences Institute.

Interfaces. Providence: TIMS and ORSA.

Management Science. Providence: The Institute for Management Sciences.

Operations Research. Baltimore, MD: Operations Research Society of America.

Sloan Management Review. Cambridge: Massachusetts Institute of Technology.

1. Management Science Problem Solving Frame of Reference--Nature of management science knowledge and processes; use of management science knowledge in problem structuring, identifying acceptable strategies, and developing control benchmarks for performance appraisal; the operations research group; stages in an operations research undertaking.

Anderson, J. A., D. J. Sweeney, and T. A. Williams. An Introduction to Management Science: Quantitative Approaches to Decision Making. 4th ed. St. Paul: West Publishing, 1985.

Lee, S. M., L. J. Moore and B. W. Taylor III. Management Science. 2nd ed. Dubuque: William C. Brown, 1985.

Oxenfeldt, A. R. Cost-Benefit Analysis for Executive Decision Making. New York: AMACOM, 1980.

Thierauf, R. J., R. C. Klehamp and M. L. Rowe. Management Science: A Model Formulation Approach With Computer Applications. Columbus: Charles E. Merrill Publishing Co., 1985.

2. Management Science Models--The major quantitative skills, models, and techniques that are most useful in a variety of management science applications.

Burton, R. M., J. C. Chandler and H. P. Holzer. Quantitative Approaches to Business Decision Making. New York: Harper and Row, 1986.

Render, B. and R. M. Stair, Jr. Quantitative Analysis For Management. 2nd ed. Boston: Allyn & Bacon, 1985.

- a. Statistics and Mathematics--Decision analysis and probability theory, especially as support for models or services in other areas such as industrial quality control, product reliability calculation, and analysis of competitive situations, and service level evaluation.

Cooper, R. A., and A. J. Weckes. Data, Models, and Statistical Analysis. Totowa: Barnes & Noble Books, 1983.

Kroeber, D. W., and R. L. LaForge. The Manager's Guide to Statistics and Quantitative Methods. New York: McGraw-Hill, 1980.

Levin, R. I. Statistics for Management. 4th ed. Englewood Cliffs: Prentice-Hall, 1987.

Moskowitz, H. and G. P. Wright. Statistics for Management and Economics. Columbus: Charles E. Merrill, 1985.

- (1) Statistical decision theory--Utility theory; states of nature; alternatives; the "best" alternative; decision rules; the "best" decision rule; certainty and uncertainty; criteria for decision making under uncertainty.

Clark, C. T. and L. L. Schkade. Statistical Analysis for Administrative Decisions. 4th ed. Cincinnati: South-Western, 1983.

Hanke, J. E., A. Reitsch and J. P. Dickson. Statistical Decision Models for Management. Boston: Allyn & Bacon, 1984.

Mendenhall, W., R. L. Scheaffer, and D. D. Wackerly. Mathematical Statistics with Applications. Boston: Duxbury, 1981.

- (2) Probability theory--Interpretations of uncertainty; basic probability theorems; important probability theorems such as the binomial, normal, Poisson, beta, and gamma distributions and their major characteristics and applications.

Roa, M. M. Probability Theory With Applications. New York: Academic Press, 1984.

Zwarylif, F. H. Applied Business Statistics. 2nd ed. Reading: Addison Wesley, 1984.

- (3) Sampling--Sampling distributions; design or selection of single, double, or sequential sampling plans; simple random, stratified, and cluster sampling; interpretation of sampling results.

McCall, C. M., Jr. Sampling and Statistics Handbook for Research. Ames: Iowa State University Press, 1982.

Sukhatme, P. V., et al. Sampling Theory of Surveys: With Applications. 3rd ed. Ames: Iowa State University Press; New Delhi: Indian Society of Agricultural Statistics, 1984.

- (4) Data relationships--Regression analysis; multivariate analysis; design of experiments; hypothesis testing and statistical inference; type I and type II errors; use of cumulative probability distributions to accept or reject a hypothesis.

Erikson, W. J. and D. P. Hall, Jr. Computer Models for Management Science. Reading: Addison-Wesley, 1983.

Heinze, D. Management Science: Introductory Concepts and Applications. 2nd ed. Cincinnati: South-Western, 1982.

- (5) Matrix models--Two-person zero-sum games; Markov processes; Leontief (input-output) matrices.

Burns, J. R., and L. M. Austin. Management Science Models and the Microcomputer. New York: Macmillan, 1985.

Kerzner, H. and D. I. Cleland. Project/Matrix Management Policy and Strategy: Cases and Situations. New York: Van Nostrand Reinhold Co., 1985.

Wagner, H. Principles of Operations Research. 2nd ed. Englewood Cliffs: Prentice-Hall, 1975.

- b. Forecasting--Use of time series to anticipate future values of variables or relationships among variable in order to predict demand, anticipate economic or financial relationships, or to model complex situations.

Hanke, J. E., and A. G. Reitsch. Business Forecasting. 2nd ed. Boston: Allyn & Bacon, 1986.

Makridakis, S. G., S. C. Wheelwright, and V. E. McGee. Forecasting, Methods, and Applications. 2nd ed. New York: John Wiley & Sons, 1983.

Wheelwright, S. L. and S. Makridakis. Forecasting Methods for Management. 4th ed. New York: John Wiley & Sons, 1985.

- (1) Smoothing--Single, double, and triple exponential smoothing; effect of size of smoothing constant; effect of transients such as step, ramp, or impulse change in time series being analyzed.

Anderson, D. R., D. J. Sweeney, and T. A. Williams. An Introduction to Management Science. 4th ed. St. Paul: West Publishing Company, 1985.

Trockel, W. Market Demand: An Analysis of Large Enomics With Non-Convex Preferences. Berlin; New York: Springer-Verlag, 1984.

- (2) Time series analysis--Simple and compound moving averages; dealing with random, seasonal, and cyclical variation; Fourier series analysis; multiple regression analysis.

Box, G. E. P., and G. M. Jenkins. Times Series Analysis: Forecasting and Control. Rev. ed. San Francisco: Holden-Day, 1976.

Dielman, T. E. Polled Data for Financial Markets. Ann Arbor: UMI Research Press, 1980.

Makridakis, S., et al. The Forecasting Accuracy of Major Time Series Models. Chichester; New York: John Wiley & Sons, 1984.

Roberts, H. V. Time Series and Forecasting With IMA. Palo Alto: Scientific Press; New York: McGraw-Hill. Distributed by McGraw-Hill, 1984.

- (3) Forecasting standards--If forecasts are of business financial position.

Thomopoulos, N. T. Applied Forecasting Methods. Englewood Cliffs: Prentice-Hall, 1980.

Wheelwright, S. C., and S. Makridakis. Forecasting Methods for Management. 4th ed. New York: John Wiley & Sons, 1985.

- c. Mathematical Programming and Networks--Network methods of analyzing complex problems, usually involving a large number of variables and relationships among variables; objective is to optimize some weighted sum of variable values.

- (1) Linear programming--Graphical and simplex methods of solution; postoptimality analysis; formulation of major prototype problems such as diet, warehouse, product mix, transportation, and production scheduling; goal programming; linear programming under uncertainty.

Anderson, D. R., D. J. Sweeney and T. A. Williams. An Introduction to Management Science: Quantitative Approaches to Decision Making. 4th ed. St. Paul: West Publishing Co., 1985.

Schrage, L. E. Linear, Integer, and Quadratic Programming with LINDO. Palo Alto: Scientific Press, 1984.

- (2) Integer programming--When integer programming is preferable to ordinary linear programming and methods such as the cutting plane technique of seeking a solution to integer programming problems.

Johnson, E. L. Integer Programming: Facets, Subadditivity, and Duality for Group and Semi-group Problems. Philadelphia: Society for Industrial and Applied Mathematics, 1980.

Salkin, H. M. Integer Programming. Reading: Addison-Wesley, 1975.

Schrage, L. E. Linear, Integer, and Quadratic Programming With LINDO. 2nd ed. Palo Alto: Scientific Press, 1984.

Taha, H. Integer Programming: Theory, Applications, and Computations. New York: Academic Press, 1975.

- (3) Project scheduling and control--Critical path methods; PERT, PERT-CPM and similar control methods; formulation of project scheduling problems and application of resulting control information to achieve desired combination of overall project cost and completion time.

Locker, K. G. Critical Path Analysis and Other Project Network Techniques. 4th ed. London; Marshfield: Pitman, 1984.

Moder, J. J., C. R. Phillips and E. W. Davis. Project Management With CPM, PERT, and Precedence Diagramming. 3rd ed. New York: Van Nostrand Reinhold, 1983.

- (4) Dynamic programming--Principle of recursive optimization; problem formulation; continuous and discrete formulations; major prototype applications such as production scheduling and distribution of effort (maximum of two constraints); probabilistic dynamic programming.

Denardo, E. V. Dynamic Programming: Models and Applications. Englewood Cliffs: Prentice-Hall, 1982.

Mangel, M. Decision and Control in Uncertain Resource Systems. Orlando: Academic Press, 1985.

Ross, S. M. Introduction to Stochastic Dynamic Programming. New York: Academic Press, 1983.

- d. Waiting Line--Queuing theory; queue discipline; service mechanism; arrivals; dynamic behavior and steady state.

Gross, D., and C. M. Harris. Fundamentals of Queueing Theory. 2nd ed. New York: John Wiley & Sons, 1985.

Lazowska, E. D., et al. Quantitative System Performance: A Computer System Analysis Using Queueing Network Models. Englewood Cliffs: Prentice-Hall, 1984.

- e. Inventory Models--Methods of analyzing relationships between demand and production; concept of inventory policy (order quantity and replenishment point); concept of service level; determining or estimating costs of inventory function.

Davis, K. R., and P. G. McKeown. Quantitative Models for Management. 2nd ed. Belmont: Wadsworth, 1984.

Tersine, R. J. Principles of Inventory and Materials Management. 2nd ed. New York: North Holland, 1982.

- f. Simulation--Model formulation, computer implementation, validation methods; analog, iconic, and symbolic models; adequacy of representation; static and dynamic simulation methods; deterministic and Monte Carlo approaches.

Banks, J. and J. S. Carson, II. Discrete-Event System Simulation. Englewood Cliffs: Prentice-Hall, 1984.

Law, A. M., and W. D. Kelton. Simulation Modelling & Analysis. New York: McGraw-Hill, 1982.

Simulation in Inventory and Production Control: Proceedings at the Conference on Simulation in Inventory and Production Control, 27-29 January 1983, San Diego, California/edited by Haluk Bekiraglu
-- LaJolla, Calif.: Society for Computer Simulation, 1983.

3. Management Science Application Areas--Management science models and techniques are broadly applicable throughout the range of organizational activity. Knowledge of application areas is an essential part of a management scientist's proficiency. The application areas are numerous and include specific industry applications as well as functional applications. The following is a partial list of application areas in which the applications have become a part of the management sciences body of knowledge.

a. General Management--Corporate planning; investment analysis; acquisition analysis; plant site selection; new product evaluation; project control; R&D planning and project selection; personnel scheduling.

Austin, L. M. and J. R. Burns. Management Science: An Aid for Managerial Decision Making. New York: Macmillan; London: Collier Macmillan, 1985.

Burton, R. M., J. S. Chandler and M. P. Holzer. Quantitative Approaches to Business Decision Making. New York: Harper and Row, 1986.

Grinyer, P. H., and J. Wooller. Corporate Models Today -- A New Tool for Financial Management. London: Institute of Chartered Accountants, 1978.

Traenkle, S. W., E. B. Cox, and J. A. Bullard. The Use of Financial Models in Business. New York: Financial Executives Research Foundation, 1975.

b. Finance and Accounting--Financial planning projections; cash flow forecasting; capital budgeting; capital investment performance forecasting; credit analysis; long-range financial strategy; capital structure analysis; lease buy decisions; reserves determination; auditing (sampling plans, and auditor-assignment scheduling).

Mullins, D. Wiley, Jr., and R. B. Mononuff. "Applications of Inventory Cash Management Models," in Modern Developments in Financial Management. Steward C. Myers, ed. New York: Praeger, 1976.

c. Operations--Multiplant production allocation; inventory management; production planning and scheduling; job scheduling and control; ingredients blending, routine and sequencing of materials flow; facilities and process layout; line balancing and pacing; shop loading and capacity planning; quality control; product reliability.

Elsayed, E. A. and T. O. Boucher. Analysis and Control of Production Systems. Englewood Cliffs: Prentice-Hall, 1985.

Plossl, G. W. Production and Inventory Control: Principles and Techniques. 2nd ed. Englewood Cliffs: Prentice-Hall, 1985.

Sawaya, W. J., and W. C. Giauque. Production/Operations Management. Harcourt, Brace, Javonovich, 1986.

Wagner, H. Principles of Operations Research with Applications to Managerial Decisions. 2nd ed. Englewood Cliffs: Prentice-Hall, 1975.

- d. Marketing--Sales forecasting; market share analysis; product mix analysis; advertising media selection; sales force planning and control; advertising budgeting and planning; product-line planning; promotion budgeting and planning; distribution and logistics applications such as: facilities location, product routing, mode of transportation analysis, carrier routing and scheduling; multilocation inventory planning and control.

Davis, K. R. Marketing Management. 5th ed. New York: John Wiley & Sons, 1985.

Warshaw, M. R., J. D. Scott, and M. R. Warshaw. Introduction to Marketing Management. 5th ed. Homewood: Richard D. Irwin, 1985.

Office Automation

Journals and Magazines

ARMA Records Management Quarterly Prairie Village, Kansas: Association of Record Managers and Administrators, Inc.

Data Management Parkridge, Ill.: Data Processing Association

Datamation New York: Technical Publishing

IBM Systems Update Armonk, NY: International Business Machine Corporation

Info Systems Wheaton, Ill.: Nitchcock Publishing Co.

Info World Menlo Park, CA: Popular Computing Inc.

Information Management Woodburg, NY: PTN Publishing Co.

ISO World Framingham, Mass.: C. W. Communications

Lotus Neptune NJ: Lotus Publishing Corporation

Micro Update New York: National Office Microcomputer Technology Group, Arthur Young & Co.

Modern Office Technology Cleveland, OH: Penton/IDS Inc.

Office Administration and Automation Framingham, Mass.: C. W. Communications/Inc.

Office Products Dealers Wheaton, Ill.: Nitchcock Publishing Co.

Barcomb, D. Office Automation. Bedford: Digital Press, 1981.

Doswell, A. Office Automation. New York: John Wiley & Sons, 1983.

Smith, H. T., W. H. Baker, M. Sumner, A. J. Bate. Automated Office Systems Management. New York: John Wiley & Sons, 1985.

1. Word Processing

Bergerud, M., and J. Gonzalez. Word/Information Processing: Concepts of Office Automation. New York: John Wiley & Sons, 1984.

Flores, I. Word Processing Handbook. New York: Van Nostrand Reinhold Co., 1983.

Holtz, H. Word Processing for Business Publications: How to Produce Proposals, Manuals, Catalogs, Newsletters, and More. New York: McGraw-Hill, 1985.

Kish, J. L., Jr. Word Processing in the Transitional Office. New York: Van Nostrand Reinhold, 1985.

Stallard, J. J., R. E. Smith, D. Reese. The Electronic Office: A Guide for Managers. Homewood: Dow Jones - Irwin, 1983.

a. Dictation

Eickson, R., R. Landroth and F. Maloney. Legal Dictation, Machine Transcription, Typewriting Practice. New York: Dictation Disc Co., 1982.

Uris, A. The Dictation Book. Willow Grove: International Word Processing Association, 1980.

b. OCR

Casady, M. J., and D. C. Sandburg. Word/Information Processing. Cincinnati: South-Western, 1985.

c. Photo Composition

Prouty, J. W. From Word Processing to Workstations: Insights Into Automation. New York: AMA Membership Publications Division, American Management Associations, 1983.

d. Dedicated versus Multitask

Scriven, M. Word Magic: Evaluating and Selecting Word Processing. Belmont: Lifetime Learning Publications, 1983.

e. Shared versus Stand Alone

Bergerud, M. and J. Gonzalez. Word/Information Processing. New York: John Wiley & Sons, 1984.

f. Typewriter versus Word Processor

Charates, D. M. Office Automation the Productivity Challenge. Englewood Cliffs: Prentice-Hall, Inc., 1982.

Stressman, P. A. Information Payoff: The Transformation of Work in the Electronic Age. New York: Free Press; London: Collier Macmillan, 1985.

2. Data Maintained

a. Source Documents

Miller, R. E. and P. D. Blair. Input-Output Analysis: Foundations and Extensions. Englewood Cliffs: Prentice-Hall, 1985.

b. COM

Stallard, J. J. and George R. Terry. Office Systems Management. Homewood: Richard D. Irwin, 1984.

c. Readers

All About Optical Readers. Delran: Datapro Research Corporation, 1981.

Costigan, D. M. Micrographic Systems. 5th ed. Silver Spring: National Micrographics Association, 1980.

Kish, J. L., Jr. Micrographics: A User's Manual. New York: John Wiley & Sons, 1980.

(1) Microfiche

Keeling, B. L., and N. F. Kallaus. Administrative Office Management. Cincinnati: South-Western, 1983.

(2) Microfilm

All About Computer Output Microfilms. Delran: Datapro Research Corporation, 1981.

Greenwood, F. and M. M. Greenwood. Office Technology Principles of Automation. Reston: Reston Publishing Company, 1984.

d. Computer Assisted Retrieval

Waterhouse, S. A. Office Automation and Word Processing Fundamentals. New York: Harper and Row, 1984.

e. Media

Booth, P. F. and M. L. South. Information Filing and Finding. Buckden Cambridgeshire: ELM Publications, 1982.

Lee, J. H., ed., On-Line Searching: The Basics, Settings, and Management. Littleton: Libraries Unlimited, 1984.

Lieberman, M. A., G. J. Selig, and J. J. Walsh. Office Automation. New York: John Wiley & Sons, 1982.

Nash, J. F., and M. B. Roberts. Accounting Informational Systems. New York: Macmillan, 1984.

(1) Paper

Winston, S. The Organized Executive: A Program for Productivity: New Ways to Manage Time, Paper, and People. New York: Norton, 1983.

(2) Video disk

Smith, H. T., W. M. Baker, M. Sumner, and A. J. Bates. Automated Office Systems Management. New York: John Wiley & Sons, 1985.

(3) Micrographics

Barcomb, D. Office Automation: A Survey of Tools and Techniques. Bedford: Digital Equipment Corp., 1981.

Cesady, M. J., and D. C. Sandburg. Word/Information Processing. Cincinnati: South-Western, 1985.

Diamond, S. Z. Records Management: A Practical Guide. New York: American Management Association, 1983.

(4) Magnetic

Chorafas, D. N. Office Automation the Productivity Challenge. Englewood Cliffs: Prentice-Hall, 1982.

Jorgensen, F. The Complete Handbook of Magnetic Recording. Blue Ridge Summit: TAB Books, 1980.

3. Reprographics

a. Offset

Jauneau, R. Small Printing Houses and Modern Technology. Paris: Unesco Press, 1981.

Latimer, M. C. Production Planning and Repro Mechanicals for Offset Printing. New York: McGraw-Hill, 1980.

- b. Stencil
 - Fobel, J. and J. Soleach with R. Leader. The Stencil Book. New York: Van Nostrand Reinhold, 1983.
 - c. Copier
 - All About Copiers. Delran: Datapro Research Corp., 1981.
 - Selected Office Copiers: High Volume. Delran: Datapro Research Corp., 1981.
 - d. Major Press
 - Marshall, Alan. Changing the Word: The Printing Industry in Transition. London: Comedia Publishing Group, 1983.
 - e. Camera
 - Adams, A. E. with the collaboration of R. Baker. The Camera. Boston: New York Graphic Society, 1980.
4. Data Processing
- Abbott, J. Presentation of Computer I/O for People. Oxford: MCC Publications, The National Computing Center, 1983.
 - Katzan, H. Office Automation: A Manager's Guide. New York: AMACOM, 1982.
 - Sanders, D. H. Computers in Business. New York: McGraw-Hill, 1979.
 - Shelly, G. B., and T. J. Cashman. Introduction to Computers and Data Processing. Fullerton: Anaheim Publishing Company, 1980.
 - Silver, G. A., and J. D. Silver. Data Processing for Business. New York: Harcourt Brace Jovanovich, 1981.
- a. Micro
 - Flores, I. and M. Feveman. The Professional Microcomputer Handbook. New York: Van Nostrand Reinhold Co., 1986.
 - Holtz, H. Computer Work Stations: A Manager's Guide to Office Automation and Multi-User Systems. New York: Chapman and Hall, 1985.
 - b. Mini
 - Bodnar, G. Accounting Information Systems. Boston: Allyn & Bacon Inc., 1983.
 - Griffiths, J.. Application of Minicomputers and Microcomputers to Information Handling. UNISIST. New York: UNIPUP, 1983.
 - Nolan, R. L. Managing the Data Resource Function. St. Paul, Minnesota: West Publishing Co., 1982.

c. Mainframe

Werner, M. D., and T. W. Warner. Micros, Minis, and Mainframes: Computing Options for the Business Manager. Rader: Chilton Book Co., 1984.

d. Calculators

Henrieli, P. Essentials of Numerical Analysis; With Pocket Calculator Demonstrations. New York: John Wiley & Sons, 1982.

Hohenstein, L. C. Using Programmable Calculators for Business. New York: John Wiley & Sons, Inc., 1982.

e. Graphics

Bertin, J.; Translated by W. J. Berg and P. Scott. Graphics and Graphic Information-Processing. Berlin; New York: de Gruyter, 1981.

f. Printers

Waterhouse, S. A. Office Automation and Word Processing Fundamentals. New York: Harper & Row, 1983.

Webster, T., with assistance from L. Costelloe, M. Mullins and C. Walsh. Terminals and Printers Buyer's Guide. New York: McGraw-Hill, 1984.

g. Input

Abbott, J. Presentation of Computer I/O for People. Oxford: NCC Publications, The National Computing Center, 1983.

5. Telecommunications

Arredondo, L. A. Telecommunications Management for Business and Government. 2nd ed. New York: The Telecom Library, Inc., 1981.

Cooper, G. R. and C. D. McGillem. Modem Communications and Spread Spectrum. New York: McGraw-Hill, 1986.

Roden, M. S. Analog and Digital Communication Systems. 2nd ed. Englewood Cliffs: Prentice-Hall, 1985.

a. Telephone Systems

Fuhrman, J. C. Telemangement: How to Select and Manage Your Business and Telephone System: A Guide for the Nontechnical Manager. Englewood Cliffs: Prentice-Hall, 1985.

Kaufman, B. Cost-Effective Telecommunications Management: Turning Telephone Costs Into Profits. Boston: CBI Publishing Co., 1983.

Pool, I. d. S. Forecasting the Telephone: A Retrospective Technology Assessment. Norwood: Ablex, 1983.

b. PBX

Dimension PBX and Alternatives. 3rd ed. Wellesley: G.E.D. Information Sciences, 1980.

c. Fax

Costigan, D. M. Facsimile Transmission: Electronic Delivery of Documents and Graphics. New York: Van Nostrand Reinhold Co., 1978.

d. Commercial Networks

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