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AFIT/GIR/LSM/90D-3

AN ASSESSMENT OF THE FACTORS IN OFFICE
AUTOMATION SYSTEMS AFFECTING AIR FORCE
MIDDLE MANAGERS AND CLERICAL WORKERS IN
THE INFORMATION MANAGEMENT CAREER FIELD

THESIS

Loy C. Cook, Captain, USAF

AFIT/GIR/LSM/90D-3

The opinions and conclusions in this paper are those of the author and are not intended to represent the official position of the DOD, USAF, or any other government agency.



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AN ASSESSMENT OF THE FACTORS IN OFFICE AUTOMATION SYSTEMS
AFFECTING AIR FORCE MIDDLE MANAGERS AND CLERICAL WORKERS
IN THE INFORMATION MANAGEMENT CAREER FIELD

THESIS PROPOSAL

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Information Management

Loy C. Cook, B. S.

Captain, USAF

December 1990

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Preface

The purpose of this study was to investigate the attitudes and opinions of Air Force information management personnel on two office automation systems, RAMS and RIMS. Although both systems were implemented for some time, no in-depth study had been accomplished. A survey questionnaire was used to interview both managers and clerical workers to get a broad spectrum of attitudes and opinions.

Statistix, a PC based software program, was used to determine the frequency distributions and significance of the numerical data obtained from the interviews. Much qualitative information was obtained from the interviews and is addressed as additional items.

Throughout the writing of this thesis, I have had a great deal of help and support from others. I am especially grateful to my thesis advisor, Major Phillip Beard, for his unwavering enthusiasm. I would also like to thank my reader, Mr Jeff Daneman, for helping me interpret the statistical information. I also wish to thank my GIR classmates for the advice and support they provided during the development and writing of this thesis. Finally, I want to thank my wife and son for their patience and support throughout the research process and writing of this thesis.

Loy C. Cook

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Abstract

The purpose of this ~~study~~ was to investigate the attitudes and opinions of personnel affected by two office automation systems, Reprographics Automated Management System (RAMS) and Records Information Management System (RIMS). Eight investigative questions were posed: (1) How receptive were information management personnel to the office automation systems (RAMS and RIMS)? (2) Were information management personnel's perceptions different now from the period prior to installation of the office automation systems? (3) What is the frequency of use for each office automation system? (4) What major factors impede these office automation projects (RAMS/RIMS)? (5) What major factors facilitate these office automation projects (RAMS/RIMS)? (6) How much change did RAMS/RIMS bring into the work environment of the information management personnel? (7) Is there a difference in the receptivity of office automation systems between managers and clerical workers? (8) Are there any perceived additional benefits to the office automation systems?

This study found both RAMS and RIMS had a moderate degree of receptivity prior to their implementation. The users of both systems were aware of the implementations at least four months in advance and learned of the implementation through their supervisor or in a formal manner. Information management personnel's reactions did

not change significantly after the implementation.

Both RAMS and RIMS were used routinely by information management personnel. RIMS users used the program slightly less often than did RAMS users. The overall use of both systems was good. No major environmental factors impeded the two OA systems. However, the users did not have a central person to go to for answers to their questions about software problems.

Many common items were found to facilitate the use of RAMS and RIMS. Both RAMS and RIMS brought significant change into the work environment of information management personnel. There was no significant difference in the receptivity of RAMS and RIMS between managers and clerical workers in this study. Overall, users perceived RAMS and RIMS as meeting the needs of their jobs. Several items were suggested and listed for improving the systems.

Three recommendations follow from this research. The first is to form user groups at the base and command levels for both RAMS and RIMS to facilitate trouble shooting problems that users find. The second is to include RAMS and RIMS in promotion testing for military members and in job descriptions for civilian workers. The third recommendation is to continue the research to improve the validity of the findings.

AN ASSESSMENT OF THE FACTORS IN OFFICE AUTOMATION SYSTEMS AFFECTING AIR FORCE MIDDLE MANAGERS AND CLERICAL WORKERS IN THE INFORMATION MANAGEMENT CAREER FIELD

I. Introduction

Overview

This chapter provides background information on this study's general issue, the focus of the study, its purpose and justification, its investigative questions, and the scope of the study's application.

Background

In recent years, the Air Force, like other branches in the Federal Government and private industry, has turned increasingly to the use of office automation (OA) products to improve the efficiency in the office environment. As reliance on OA products increases, the importance of measuring and interpreting the benefits of OA on personnel and organizations will be magnified. As noted by Warren in a 1986 study:

The Air Force experience with the implementation of OA has often been characterized by a lack of documented evidence on the actual quantitative and qualitative benefits experienced through the use of OA. With the ever increasing competition for the dwindling budgetary dollar, the need for requirements analyses and procurement justifications for acquisition of OA systems which take advantage of the results of previous OA projects has reached a new level of importance. (38:iii).

The Air Force office environment is ready for an OA revolution through computer technology. With decreasing personnel and budget cuts, OA may be an answer to many management problems faced by the Air Force. Although OA is not a cure all for managements problems, it has significant implications for the office of the future (29:577).

Air Force information management functions are becoming more automated each year. Within the last five years, the base locator, records management, copier management and publications distribution office were automated with software programs using a microcomputer. Information management personnel have the opportunity to increase both quantity and quality of products through such new programs as Personnel Concept III, a personnel program being tested and reviewed for implementation Air Force-wide (9:2). In 1987, Smith (32:68-69) compared the implementation of office automation systems in the Air Force and civilian industry and made four specific conclusions:

- 1) A successful implementation appears to require specific criteria and organizationally accepted system goals. In particular, these goals are necessary to provide a biased measure so the relative success of an implementation can be determined. But just as important these goals must be actively pursued by the organization.

- 2) The top management support that is direct and consistent in its own actions appears to be tied directly to IS [Information Systems]/OA success; especially, top management support that was overt, unmistakable, and highly visible.

- 3) An active planning process, and an active program that ensures the personnel are aware of the planning

process, is consistent with a successful implementation.

4) There is no difference in terms of funding, user consideration, and training between government and civilian implementations, at least as perceived by the personnel interviewed (32:69).

Based on the results he achieved, Smith recommended further research in the area of IS/OA to benefit the Air Force (32:77).

When the Department of Defense reorganized in 1986, the Directorate of Administration for the Air Force was given the task of management and policy for all Air Force information, both electronic and written. With this tasking and the large number of microcomputers in use within the Air Force, information managers have an expanded role in managing OA systems (20).

Starting in 1983, the Air Force began implementing OA technology in three specific areas of information management (then called administration) (10). These three areas were in the records and files program, the copier program, and the publications and distribution office. All three areas used software developed by contractors to implement OA in these programs. The OA programs are essentially database management systems designed to replace labor intensive and expensive manual programs (2,10).

Reprographics Automated Management System (RAMS)

RAMS, operational at over 80 sites Air Force wide, is an automated management system for printing plants, duplicating centers, and base level copier managers. The 1983 Automation Users Group identified RAMS as the second major priority within administration (7). Lacking funds and personnel to work the program at higher levels, Air Force Systems Command (AFSC) accepted lead command responsibilities for implementation and development of RAMS in August 1984 (10).

The specified program objectives for RAMS are to reduce manual record keeping and reporting, standardize management of reprographics activities, and to produce timely customer information and management reports (10).

The primary purpose of RAMS is to automate generation of reports required by the Congressional Joint Committee on Printing which oversees printing by all Federal government agencies (24). RAMS contains modules for managing the following areas:

- commercial printing
- duplicating
- printing
- micrographies
- composition
- copier program (2)

Verac Corporation, a small development firm, won the bid for developing RAMS and, after initial false starts, developed a RAMS program using dBASE III software. Although RAMS was delivered in June 1986 and training provided for implementation, serious software problems kept the program from being implemented at beta test sites until June 1987. The first bases to receive RAMS were: Offutt AFB NE; Gunter AFB AL; Mather AFB CA; Randolph AFB TX; and the Air Force Academy CO (7).

Between June 1987 and March 1988, RAMS was tested extensively in the field where problems were identified requiring correction of RAMS software. Software speed was the most noted area requiring attention. The latest version of RAMS exceeds the original improvement goals and provides a better product for the field to use. The improved features of RAMS include:

- a quicker program response time (150-500 percent faster)
- a reduction in number of menus and selections
- easy access and exit for fast queries
- a better user's manual
- reduced program size
- help screens (2)

RAMS is not a mandatory program for all Air Force bases due to some printing plants having their own in-house automated system (7).

Future planned improvements include help screens throughout, a quick copy job entry screen, and developing input screens that resemble request forms (2).

Records Information Management System (RIMS)

RIMS, operational at over 700 sites Air Force wide, is an automated management system for base level records managers. A requirement for an information system for records management was identified and documented in August 1985. As with RAMS, AFSC accepted lead command responsibility for development of RIMS (38).

After a preliminary and critical design review, Ball Systems Engineering Division began the programming effort in March 1987. Operational testing was begun in July 1987 and lasted until September 1987 at Eglin AFB FL, Langley AFB VA, and Norton AFB CA. On-site test validation was performed by Headquarters (HQ) AFSC and the Standard Systems Center (SSC) during operational testing. Further testing, analysis, review, and problem simulation was conducted from September 1987 to February 1988 by Secretary of the Air Force (SAF)/AADO, SSC and HQ AFSC. The contractor made further software improvements from February 1988 to March 1988.

Operational testing was conducted from May 1988 to June 1988 at the same three bases. Final acceptance testing was completed in July 1988 by SSC, SAF/AADO, and AFSC/DAD. The contractor delivered RIMS in August 1988 and a

pre-implementation plan was sent to the major commands. RIMS was released to the major commands in February 1989 for implementation (38).

The RIMS program objectives are to standardize file plans and disposition procedures, maintain accountability for records and freedom of information act (FOIA) requests, and to create an on-line Air Force Regulation (AFR) 12-50 database (10).

RIMS is designed to automate the creation of file plans and labels for all organizational users, manage the base records staging area inventory, manage the freedom of information act program, and track training and staff assistance visit schedules (2).

Future developments for RIMS include building a unit level module which would allow entry of file plans which could be uploaded to the base level machine. This would provide the capability to do subdivisions of work to the unit level and allow unit level clerks to print their own data. More program speed and user flexibility are planned for future releases (2).

Focus of the Study

Generally, Air Force Institute of Technology (AFIT) Graduate Information Resource (GIR) Management students will work as base information managers, upon graduation. The three office automation programs they will be managing are RAMS, RIMS, and the Publishing Distribution Office System.

All three systems were recently implemented and require considerable oversight and management (10). The impact of these three systems on the user personnel and organizations will be of significant importance to the Air Force information manager. Due to the number of interviews to be conducted, this study will focus only on the impact of RAMS and RIMS on their respective organizations.

Purpose

The purpose of this study was to investigate the attitudes and opinions of personnel affected by the two OA systems, RAMS and RIMS. To determine how receptive personnel are to these OA systems, they were asked direct questions concerning their attitudes toward the OA systems.

This investigation looked for the frequency of use of OA systems in terms of hours and the number of times per week that a system is used. Of considerable importance, the factors that impede or facilitate OA systems are examined by having users rate a list of common factors that impact OA systems. Factors impacting the work performance of information management personnel were investigated by asking users to rate different aspects of their jobs in relation to the OA systems.

Also, this study compared the difference in OA impact between managers and clerical personnel in the Air Force. For the purpose of this study, clerical workers were defined as direct system users and did not supervise other personnel

using the system. Managers could or could not be direct system users, but did supervise personnel using the system. The study looked for additional perceived benefits of OA systems by asking users for additional benefits beyond the scope of RAMS and RIMS.

Investigative Questions

The objective of this study will be met by examining the responses to the following investigative questions:

1. How receptive were information management personnel to the office automation systems (RAMS and RIMS)?
2. Were information management personnel's perceptions different now from the period prior to installation of the office automation systems?
3. What is the frequency of use for each office automation system?
4. What major factors impede these office automation projects (RAMS/RIMS)?
5. What major factors facilitate these office automation projects (RAMS/RIMS)?
6. How much change did RIMS/RAMS bring into the work environment of the information management personnel?
7. Is there a difference in the receptivity of office automation systems between managers and clerical workers?
8. Are there any perceived additional benefits to the office automation systems?

Scope

The scope of this study is limited to the information management career field and to those OA systems peculiar to their career field, i.e. RAMS and RIMS. Because OA is

expanding into most career fields, this study might be used for a comparison with other OA products but does not necessarily apply to other career fields. The questionnaire used in this study provides a snapshot in time of these two OA systems. The study was not intended for past or future representations of these OA systems.

The results of this study may not be applicable for these OA systems in all commands or bases. The personnel interviewed were limited to Continental United States (CONUS) commands and bases because of the time constraints and feasibility of CONUS interviews. No other OA systems were considered in this study.

Organization of the Thesis

The thesis is organized and presented in accordance with the model suggested in AFIT's Style Guide for Theses and Dissertations (35).

Chapter I contains an introduction to the study including the background issues, a statement of the study's focus, purpose and justification, investigative questions, and scope.

Chapter II contains a review of the literature relevant to the study's issue. Topics discussed include social impacts, specific Air Force studies, job skills, supervision, and changes in employment.

Chapter III contains the methodology to be employed to gather information and the design used in the study for the data analysis.

Chapter IV contains the analysis of the data collected and a comparison of the two OA systems.

Chapter V contains a summary of the study, conclusions drawn from the data analysis, and recommendations for the future research as a result of the study's findings.

II. Literature Review

Overview

This literature review is applicable to the subject of OA and its implementation. This review examines previous research including demographic information used in research studies and factors associated with successful OA implementations. The literature covered includes advantages of OA to the organization, manager, and clerical worker. Also covered is the social impact of OA on managers and clerical workers. The final area examined effects of OA on users in their environments.

General Review

Review of the literature yielded numerous variables considered important to OA implementations. As in all studies, demographic information is highly important. Specific factors observed were age, education, position, length of employment, experience, and gender. The two most often mentioned factors important in successful OA implementations were involvement of users in development, and support from upper management.

Although savings in dollars and manpower are the most sought after elements of OA, other advantages such as quality products and relative advantage are highly

important. There is an immense social impact through OA, both technically and behaviorally. There are mixed results in studies of the social impact of OA systems. Finally, researchers reached a consensus on the impact of OA on users. How to measure the impact and the results achieved were indeterminate. The literature review shows there is division among authors as to what is important in measuring the impact of OA.

Importance of Demographic Information

Demographic information provides important data about respondents, such as age, education and other background information. Data from demographics help classify respondents into different groups, aiding in analyzing survey or interview findings (4:171). For example, a survey may observe differences in attitudes and opinions between clerical workers and managers in an organization about an office automation system. Demographic questions would help separate different attitudes and opinions of managers and clerical workers about the system (4).

Demographic information is a necessary part of the facts about a respondent and can be compared to the same facts as they apply to the population. The purpose of comparing demographic information to the population is to determine whether the sample accurately represents the overall population (4:171).

Demographic information most often used included position, age, length of employment, education, experience, and gender (13, 22, 29, 32).

Successful OA Implementation

Factors that make a successful OA implementation are a major area of research in the study of OA systems. Swanson, Ginsburg, Davis, McKeen, and Robey consider this area critical because the true value is not realized if the OA system is unsuccessful (12, 15, 21, 27, 36). It is very difficult to identify any one factor as being the main determinant in a successful implementation. Some management textbooks tend to accept a contingency approach to establishing any organizational change (18, 23, 30). The main problem with the contingency approach is identifying to what extent each factor is key to successful implementation. This problem in the contingency approach is still under review (23). Swanson, Smith, Ginzberg, and Robey observed what factors influence successful OA implementations. Although they were not in complete agreement, there was some consensus of opinion (15, 27, 32, 36). Two areas mentioned most often as contributing to successful implementations were user involvement and upper management support (1, 15, 27, 32, 36).

Successful implementation begins long before the implementation stage of the program (1:74). This includes getting managers and users involved from the initial

contact. Developers should request support from all groups impacted by the new OA system. By getting all groups involved from the start, each group will feel they have input directly or indirectly to the OA project (1:74).

Before and during implementation, users should communicate with program developers to avoid surprises for users in final program implementation (1). The OA system is in trouble if users have cables strung over their desks and they do not:

- (1) Understand the purpose and benefits of the new system;
- (2) Understand what will be required of them and how it will affect their jobs;
- (3) Feel their concerns about the system have been identified and taken into account;
- (4) Have an implementation and training schedule in their hands;
- (5) Know who to call if they have questions about the project.

If accurate information is not provided to users, the informal employee information network will fill the gaps with their own information (1:74).

One primary recommendation for a successful implementation is "getting the users involved in system development" (36:178). Smith validated this recommendation for an Air Force OA environment in a 1987 study (32:69). Specifically, he concluded, "an active planning process, and an active program that ensures personnel are aware of the

planning process, is consistent with a successful implementation" (32:69).

Ginzberg found the probability of implementing a successful system is increased by three issues:

- (1) Gaining management and user commitment to the project;
- (2) Gaining user commitment to any changes necessitated by the new system;
- (3) Assuring the project is well defined and plans are clearly specified (15:54).

Ginzberg contends user participation in designing and implementing the system increases user commitment. The more active the user is in designing and implementing the system, the more likely users are to accept the system and use it appropriately (15:54). This idea agrees with Smith's findings, cited above.

Evaluating an OA system's value is the most critical problem faced in evaluating a successful OA project (12:614). The best measure for determining a successful OA system is to determine the impact on organizational effectiveness. Changes isolating organizational effectiveness are hard to separate and difficult to measure. Because of this problem, other indicators such as the immediate environment of the system are used for measurements. Some methods for indirectly measuring effectiveness of an OA system are:

- (1) Significant task relevance. Results of system use are directly observable. For instance, an office support system results in improved turnaround of documents. For a decision support system, task

relevance is improved decision quality, which is often difficult to observe but sometimes possible to approximate through user's subjective estimates.

(2) Willingness to pay. Users may be asked to specify how much they are willing to pay for a specific reportor system capability (such as ad hoc query). This type of estimate will be very imprecise unless it is linked to an actual transfer price.

(3) System usage. System logs may permit measures of system use, or users may be asked to estimate their use of the system. This is only appropriate for systems whose usage is voluntary.

(4) User information satisfaction. Users are asked to rate their satisfaction with such aspects of the system as response time, turnaround time, vendor support, accuracy, timeliness, format of outputs, and confidence in the system (12:614).

As stated in a management textbook by Arnoudse, "That a system is in use 65 percent of the time . . . says little about the success or failure of the system in meeting business goals" (1:76). The best time to measure effectiveness of an OA system is both before and after system implementation to have a comparative indicator of improvements. Also, the value of an OA system should not be measured shortly after system implementation. There will probably be excess errors, difficulties in learning, and adjusting to new systems procedures. General resistance to change may bias both user satisfaction and systems usage (11:614).

McKeen found the definition stage was critical to making applications meet user needs (21). The definition stage at the beginning of a project design takes up perhaps 25 percent of total effort, yet important decisions shaping

the effort of the project are already in place. The projects he examined showed more time spent in the definition stage were more successful than projects rushed into production and completion. In the final analysis, users were more satisfied and programs completed within budget with ample time given to proper program definition (21:47).

In 1974, Swanson investigated involvement and appreciation of managers in using OA systems. He used a case study approach in assessing OA in a large engineering and manufacturing organization with complex electronic equipment. His results indicated managers who involve themselves in the OA system will appreciate the system more than uninvolved managers. Although this was not too surprising to managers and researchers, the research methodology he used is applicable to measuring OA systems acceptance by users (36:179).

Schewe surveyed management and clerical staff in 10 food processing firms and found "computer based information systems fall short of their theoretical capabilities." An important part of his findings was that psychological and behavioral aspects of users were unknown (29:577).

Schewe also found little correlation between usage of a system and attitudes of users. His findings are in direct contradiction to the studies of Zmud, Robey, and Dickson (13, 27, 41). His assumption was since users attitudes are

not an impediment to the use of OA, the problem is then one of ability, translating into a need for training and education (29:577). Theoretically, no matter how good the OA system or how competent the developer, the OA system could not succeed if the user is not capable (29:589).

Schewe's position is strongly challenged by Daniel Robey (27). Through his own research, Robey believes "specific attitudes are positively related to the use" of OA (27:527). Robey points out "MIS can and does fail where user psychological reactions and organizational factors are ignored by system designers" (27:527). The pressing need is for designers to create "favorable user attitudes" (27:527). Robey also believes the way to achieve improvements is through incentives because, "unless rewards are contingent upon performance, use of a system will not increase" (27:535).

Zmud reviewed the literature on individual differences in determining OA success (41). His research synthesized the findings of empirical investigations on how individual differences impact successful OA projects. Zmud's discoveries concur with Robey and finds OA impact is determined to a great extent by differences in individuals (41).

Zmud's review of the literature indicates user involvement is positively associated with OA success and user attitudes are associated with user satisfaction.

However, this is true only in the context of a given situation and environment. Zmud also determined, "the strongest associations have been observed with regard to the personal characteristics that directly relate to individual perception" (41:975).

Measuring success in an OA system is one difficult problem facing researchers at this time. Given this problem, it is no wonder there is no consensus of opinion on factors strongly influencing OA implementation. Still, the general theme thus far identifies to two to four main factors important to successful OA systems.

Advantages of OA

In most respects, OA in the Air Force is a reflection of society (32:69, 36:178). From the researcher's experience, this trend will continue into the future at an ever-increasing rate as technology hurries along in the quest for speed, size, and accuracy. The primary advantages sought by office automation are eventual savings in manpower and budget costs (6:4). However, OA offers many other benefits through quality and relative advantage, and are difficult to measure (28:61). Relative advantage, as stated by Kwon and Zmud, and quoted by Ross is defined as: "the degree to which an innovation is perceived as providing greater organizational benefits than either other innovations or the status quo" (28:27). With a shrinking

military budget, OA programs will play an important role in the new military system.

In 1984, Booz and Hamilton Inc. did a Cost Benefits Study for Laboratory Office Network Experiment (LONEX) to determine expected costs and net savings gained from implementing an OA system (6). This particular study was done at Rome Air Development Center (RADC), Griffiss AFB NY. They studied tangible paper products prepared by the organization. The study population was a single RADC division with 6 managers, 18 engineers, and 16 secretarial staff members (6:12).

Their study found time saved for managers was 2 percent, professionals-27 percent, and administrative support staff-55 percent. In addition, they extrapolated results for the whole RADC organization and found benefits to the entire organization was \$6.5M annually from a \$49.5M annual budget (6:4).

In 1987, Ross did an in-depth literature review to find factors influencing change in OA systems (28). He found the overwhelming factor affecting OA was relative advantage, accounting for about 40 percent of the findings (28:61). All other findings were lower than 10 percent for each item and were not considered important findings to the study (28:62).

Social Impact of OA

OA greatly influences social systems within organizations. These influences are often more important than technological innovations themselves.

Leavitt and Whisler first noted the social impact of OA in 1958 (19:36). Follow-up research by Dickson and Simmons (13:253-265) found reactions to OA installations ranging from failure to use outputs to outright sabotage.

More recently, Robertson found OA can have a different impact on different organizations (26:57). Each organization has its own special social group with their own attitudes and dispositions. He reasoned this was why studies on OA systems impact received mixed results and that the mixed results were considered as replicated findings (26:56-69).

Two general areas for resistance to OA were advanced in the literature: technical (or systems) problems and behavioral problems. In the area of technical problems, software and hardware developers are working to overcome shortfalls. Behavioral implications appear to pose a much more serious constraint to OA than technical problems (17:58). Users resist OA because of the inherent change it brings about. The magnitude of change itself will cause users to resist change. In 1970, Dickson and Simmons presented five factors especially related to dysfunctional behavior that are still valid today (13:255).

Primary to users' resistance to change is that complex organizations have definite departmental boundaries and divisions of formal responsibility. Changes in these boundaries and divisions occur in connection with the introduction of OA technology. Changes are planned in advance or may occur as a result of adaptations to successful use of the OA system (13:255).

Dickson and Simmons also found the impact on informal structure in the organization was important. Informal structures are present in all organizations and include values, ethical standards, taboos, and special relations for working conditions. Informal structure within an organization often has a strong influence on day-to-day functions within the organization. Frequently, the impact of behavioral disturbances on the informal structure is as serious as the impact on formal structure (13:255).

The third factor Dickson and Simmons found affecting behavior toward a new system was in personal characteristics and background of individual organizational members. Such factors include age, length of service, personality, cultural background, attitude toward the system, organizational level, and experiences with previous organizational change. Middle managers are the most likely to be affected by OA and often offer the most resistance to change (13:255).

The fourth factor influencing behavior toward OA implementation was users' responses to management involvement. Users will respond favorably toward a proposed change if management maintains open communication and allows all grievances to be heard. Past or previous experiences with OA implementation has a great deal to do with the acceptance of the new system. Users who were dissatisfied with past OA systems are not as receptive to new OA technology (13:255).

The last behavioral factor identified was the method employed to introduce change. Dickson and Simmons found conflicting information on the importance of this factor. Some researchers considered the method employed the most important variable influencing OA acceptance while other researchers focused on factors mentioned previously (13:256).

A 1983 feasibility study by Terry Young for the Air Force Data Systems Design Center (AFDSDC) was generated due to inefficiency in performing administrative and clerical functions (40:1). His study was generated because upper level management was dedicated to using a system called Administrative Documentation and Management (ADAM) (40:1).

ADAM's primary purpose was to perform software text editing to support the AFDSDC mission. Twenty percent of ADAM's capacity was originally intended to provide an AFDSDC network word processing capability. However, secretaries

who attempted to use ADAM terminals for normal correspondence perceived ADAM as not user friendly. Efforts to convert to other word processing systems were stymied because of commitment from upper management to use the word processing capability inherent in the ADAM system (40:1).

Although total support from management was lacking for the feasibility study, two top administrators in Air Force Communications Command and Air University concurred with the need for AFDSDC-wide conversion to word processing. They requested AFDSDC submit a word processing feasibility study to justify procurement of appropriate word processing equipment (40:2).

As a result of the study, Young recommended purchasing 25 word processing stations, increased authorizations for secretaries, and replacing electric typewriters with modern word processing equipment (40:24). There was no confirmation in his study to indicate what action resulted from his recommendations.

The social impact of OA is obviously important and has considerable literature devoted to OA impact on social systems. However, there is no real consensus on the full impact or which factors of OA have the biggest influence on social systems.

Effect of OA on Users

There is little doubt OA has a tremendous effect on both managers and clerical workers. Authors disagree on

those effects. The consensus is that there is an impact (3, 5, 14, 16, 22, 25). Controversial areas are whether there is an increase or decrease in the number of jobs, responsibilities, social needs, and deskilling of positions. As stated by Braverman and reported by Attewell and Rule, the deskilling perspective of OA is using OA to strip relatively skilled jobs of their conceptual content (3:1185).

Osterman completed a national survey of computer installations by industry in 1985 and found the net effect of computer automation was to decrease clerks and managers substantially. However, over time an increase in clerical and managerial workers occurred. Citing the U.S. Department of Labor in 1961 and 1985, he found the number of clerical workers increased from 9.7 million to 16.7 million, and clerical workers as a percentage of the labor force, increased from 14.6 to 15.9 percent (25:175).

Osterman's study showed the net effect between computerization in organizations, and employment of clerical workers and managers was considerably complicated. The net effect over a seven-year period appeared to have been a real reduction in employment for clerks and managers. A fairly large loss of managers and clerical workers occur within one to two years after automation and then the bureaucracy slowly rebuilds. Osterman's study revealed the later

increase in employment was not enough to offset initial employment loss (25:183-184).

"The microprocessor, or 'computer-on-a-chip' is the automated office cornerstone, the scientific innovation making the 'office of the future' a possibility" (16:197). This quote, taken from a 1982 article about OA, serves to highlight the importance of computers to OA. Osterman's literature search referred to factory and office workers in West Germany who coined a new name for microprocessor chips. German workers refer to microprocessors as "job-killers" (16:199).

As reported by Ferratt and Short (14:377), the literature has many suggestions and limited but consistent research showing users of OA have lower social needs than other workers. Their research involved a survey of 463 insurance company employee attitudes toward different work dimensions. Contrary to the literature, they found motivational patterns of personnel in OA are quite similar to other occupational groups. They further stated their methodology, although still incomplete, had better construct validity than previous studies concerning OA personnel's social needs. They concluded:

... if their (OA personnel) jobs place them in a setting that allows or involves interaction with others, our results indicate that clerical/operations and technical/professional IS people would find working with friendly, supportive people among items most likely to encourage productive work behavior. Thus, our findings do not suggest that managers should restrict interactions with and among IS people; rather,

they suggest that friendly, supportive working relationships should be encouraged (14:385).

Millman surveyed seventy-five middle managers in Montreal, Canada, looking at OA impact on middle managers and their work (22:479). Two findings resulted from her research. First, OA led middle managers to perceive a variety of changes in their jobs and work, and almost always made their jobs and work more satisfying. Second, middle managers who experienced first-hand work on OA systems were even more positive than managers without direct exposure to OA systems (22:479).

Millman concluded middle managers were more likely to be influenced by OA (22:480). Since middle managers supervise and are supervised, they are more likely to experience the impact of OA systems. Therefore, middle managers should have a better view of changes resulting from various OA systems (22:479).

One interesting item revealed by Millman's research was very few respondents reported using word processing. Millman accounted for this as either word processing not falling into the managerial role or middle managers chose to deliberately abstain from using word processing systems. This was due to the perception by managers that using such systems was for secretaries or clerical workers and not part of a managers job (22:483).

Attewell and Rule examined effects of computing in organizations and found these effects more complicated and

diverse than traditionally assumed (3:1184). They examined deskilling and upgrading of jobs as a result of OA and computing. They found upgrading and deskilling of jobs are occurring within occupations as OA affects the office environment (3:1180).

Attewell and Rule examined two survey reports covering the years 1962 to 1978 and well over 1200 managers, clerks, and data analysts in municipal government jobs about OA impact on office workers. They found job enlargement and increased job satisfaction greatly exceeded reports of downgrading of jobs and OA had a greater positive impact on jobs than a negative impact (3:1187).

David Steinbrecher said:

The problem is not the technology. It is the way the technology is implemented that creates the impression that the office of the future will evolve into a white collar sweatshop (Steinbrecher:8).

This statement points out the basic problem of user attitudes facing all automated systems and their implementation.

Barclift and Linson did a before/after quasi-experimental design study on productivity at the Standard Automated Contracting System (SACONS) in Monterey CA (5). In their study, they measured outputs (workload, quality of service), inputs (size of staff, staff grade structure, usage of overtime) and by-product social effects (morale, team-work, professionalism) using archival data. They found while workload increased slightly after implementation, the

quality measure (procurement action lead time) improved over 30 percent after implementation (5:49-57).

These results were achieved as the work staff decreased. Overtime by the staff declined sharply after automation was complete. Rather than seeing OA as a threat or a source of technologically-induced pathos, the SACONS automation removed drudgery from jobs. Workload backlogs, reflected in overtime, were prevalent before implementation. After implementation backlogs were greatly diminished, resulting in a decrease in overtime of 83 percent (5:49-57).

Installation of SACONS boosted morale, as indicated inversely by sick leave usage. Time available to assist coworkers strengthened work team cohesion and contributed to increased professionalism as noted by supervisors. Both factors heightened worker self-esteem (5:49-57).

Technology in OA is an exciting and dynamic area to study. OA effects on clerical workers and managers are as varied and complex as systems and organizations themselves. This complexity and diversity makes reaching a consensus of opinion on OA effects difficult.

Conclusion

Review of the literature revealed there is no clear-cut conclusions about OA and its impact on personnel. Implementing and analyzing OA systems involves complex characteristics. As in all studies, certain demographic information is important in analyzing the full effect of OA.

The two most important factors in successful OA implementations are user involvement and upper management support. Although monetary and manpower savings were the most sought after OA elements, quality and relative advantage are two important gains from OA. OA has an enormous social impact on an organization, both behavioral and technical. How to measure impact and what criterion to use are controversial issues.

III. Methodology

Overview

This chapter describes the steps which were taken to answer the investigative questions posed in Chapter I, thereby meeting the objective of this thesis. The objective was to identify those aspects of OA systems which impeded or facilitated the job duties of Air Force information management personnel. A thorough understanding of these aspects will aid new information managers in performing their jobs. By being aware of the full impact of OA, information managers will be better prepared to accept the challenges they face.

This chapter details data collection procedures, data analysis procedures, and specific steps for answering each investigative question proposed in Chapter I.

Data Collection Procedures

The genesis of this study came from two sources: a relevant literature review, and analysis of responses to a questionnaire adopted from a 1983 Navy study used in evaluating the impact of three OA systems. This study adopts some methodology from the 1983 Navy study (31). Additionally, other factors such as differences in the perceptions of clerical workers and managers were investigated.

As stated by Strassman in 1981 and quoted by Sheposh, "It is becoming increasingly evident that we are in a transition from an 'industrial' to an 'information society'" (31:1). This thought is still relevant today and necessitates a review of recent literature in OA which is an outgrowth of our information society. The general purpose of the literature review was to establish the overall context of factors in OA systems impacting middle managers and clerical workers. Literature from the military, government, and civilian communities provided a firm foundation of relevant information to study the factors of OA impacting personnel. Because technology has advanced OA at a rapid rate, the bulk of literature was from the last ten years.

Specific information in the literature review looked for how receptive managers and clerical workers were to OA. Also, what factors impacted the use of OA and how much an OA system is used within the organization were researched.

To determine how much these factors impacted RAMS and RIMS managers and clerical workers, interviews of information management personnel were conducted. These interviews were conducted in person at Wright-Patterson AFB, OH, and through telephone interviews of information management personnel randomly selected from each command in the CONUS. The interviews were modeled after the 1983 Navy study done by Sheposh, Hulton, and Lamras (31).

The 1983 Navy study examined investigative questions similar to those of this thesis. The Navy study looked at three particular OA systems which included hardware and software (31:9). This study looks at two software programs and the associated hardware. The hardware could significantly influence the performance of the software.

In the 1983 Navy study, 147 interviews were conducted at three Navy Research and Development Laboratories in order to determine the impact of multifunction communication systems on organizations and personnel. That study found:

- (1) there was a high degree of receptivity for the three systems;
- (2) document preparation and electronic mail were the features used most frequently;
- (3) the two factors designated as impeding the pilot project were system specific problems and insufficient number of terminals relative to demand, and factors instrumental in facilitating the pilots were the capabilities of the system and training;
- (4) the implementation strategies proposed were generally facilitative in nature (provision of funds and training);
- (5) all three systems appear to have a positive effect on work performance (31:57-68).

Questionnaire Design

The questionnaire used in the interviews was a modified version of the questionnaire used in the 1983 Navy study of three OA systems. The questionnaire was modified to fit an Air Force environment and the two OA systems, RAMS and RIMS. Also, changes were made to answer investigative question

eight. This question was not researched in the Navy study and concerned the perceived additional benefits of the OA systems.

The first topic area in the questionnaire contained introductory questions for demographic purposes such as name, age, position, etc. Some of the questions were answered on a five-point Likert scale and were used to determine the initial system acceptance and the current system acceptance. A three point Likert scale was used to describe the major impediments and factors facilitating the systems. Open-ended questions were used to discuss additional benefits of the OA systems and suggestions for further research.

When the questionnaire was drafted, it was reviewed by a panel of experts listed in Appendix A.

As stated by Carmines and Zeller, "reliability concerns the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials" (8:11). One of the most popular measures of reliability is Cronbach's alpha (also called alpha coefficient) which will be used in analyzing the data in this thesis (8:44). Cronbach's alpha measures how consistently a group of interview questions addresses an investigative question. For example, an investigative question may address whether middle managers feel an OA system has increased productivity. Cronbach's alpha would be computed on the

group of interview questions pertaining to the investigative question. Cronbach's alpha can range between 0 for a completely unreliable measure to 1.0 for a completely reliable measure. An alpha value of .6 or higher is desired for reasonable reliability (11). Each investigative question having enough measurable variables will be tested for reliability and reported with its respective table.

The survey instrument was composed of questions addressing four areas:

- (1) Demographic questions to collect data on job title, time in the unit, age, and computer experience;
- (2) When and how the system was announced, reception of the OA systems before and after implementation, and how the OA systems were used in the users daily jobs;
- (3) Productivity items including user support, items that impede, facilitate or are neutral to the system, and the level of change brought about by the OA system;
- (4) Additional items or open ended questions where interviewees could add any comments they felt relevant to the interview.

A copy of the cover letter and questionnaire are attached at Appendix B.

Population

The population of interest for this research was all users and managers of RAMS and RIMS in the CONUS. Based on information obtained in January 1989, the population for RIMS in the CONUS is located at 40 sites. With approximately three users at each site, this translates into 120 users. The RAMS population, is located at 88 sites in

the CONUS. With approximately three users at each site, this translates into 264 users (10).

A total of 20 managers and 20 clerical workers were interviewed to obtain sufficient data to conduct statistical hypothesis tests. The first interviewees were selected from Wright-Patterson AFB for convenience and interviewed in person. The remaining interviewees were randomly selected from Air Force bases throughout the CONUS based on their use of either RAMS or RIMS. These interviewees were interviewed by telephone.

Contact was made with the base, wing, or command information manager for permission to interview personnel affected by the two OA systems. Questionnaires were mailed to the interviewees prior to the interviews themselves. This aided the interviewees and interviewer in understanding questions and concerns during the interviews.

Personnel interviewed were required to have at least six months of experience with the appropriate system. All participants were interviewed individually to maximize individual responses which might have been suppressed in group interviews. All interviews were tape recorded and analyzed for content.

The information from each questionnaire was extracted and entered into a database including demographic information, five-point Likert Scale data, or with yes/no answers. Information from open-ended questions was

categorized on an individual basis to answer investigative question eight mentioned earlier in this thesis.

Data Analysis Procedures

Data analysis consisted first of descriptive statistics by arranging the responses to the questionnaire into several tables which are described later in this chapter.

Descriptive statistics were used to summarize data into useful information. Most descriptive statistics require variables to be interval or ratio. This is because most descriptive statistics summarize numerical values, and with nominal or ordinal variables, the actual values (and differences between values) do not have any real meaning.

Descriptive statistics are always appropriate for variables measured on a continuous scale. These statistics are also useful for discrete variables with many values (37:69-70). For the purpose of this thesis, the data were considered to be at least interval.

The data were manually analyzed for frequency and percentage of respondents, and the sign test for nonparametric data was used to determine whether pairs of responses show a significant pattern. For example, RIMS clerical workers opinion Likert scores before and after implementation would be pairs of responses. The sign test looked for a significant pattern of higher or lower scores in these pairs of responses. For this research the alpha level of .10, or significance of 90 percent was used.

Significance is based on the assumption that a particular theory is true and the results observed in a random sample differ markedly from those expected under the assumption of pure chance. If the observed results are markedly different we would say the differences are significant. For example, if 20 tosses of a coin yield 16 heads we would reject the theory that the coin is fair. However, it is still conceivable that the coin is fair (33:211).

The sign test requires virtually no assumptions about the paired samples other than that they are random and independent. It is especially useful for situations where quantitative measures are difficult to obtain, but where a member of the pair can be judged "greater than" or "less than" the other member of the pair (33:230).

The two-sample T test was used to test for the difference in reception of the OA systems between clerical workers and managers. The two-sample T test tests for differences between the means of two independent samples. It is applicable to situations where samples are drawn independently from two normally distributed groups (23:230).

To meet the assumption of normality, the data for each question were summed for all clerical workers and all managers. For the summed scores to be considered taken from a normal population, the scores from each population were tested using Cronbach Alpha (8:11). With an acceptable

score from Cronbach Alpha and the scores summed, the populations can be considered from separate populations for using the T test.

Data collected from open ended questions were used to discuss problems and issues on systems effectiveness, implementation problems, and recommended changes to the OA systems.

Steps for Investigative Question 1

To answer the first investigative question, how receptive were information management personnel to the office automation systems, the data were presented in Tables 5 and 6 for RAMS and 19 and 20 for RIMS. Tables 5 and 19 depict when and how the OA system was first introduced. The columns include the individual question, responses, frequency, and percentage for each question. Tables 6 and 20 deal with receptivity of the OA system prior to implementation and have the same format as Tables 5 and 19.

Steps for Investigative Question 2

To answer the second investigative question, were information management personnel's perceptions different now from the period prior to installation of the office automation systems, the data are presented in Tables 7 and 8 for RAMS and Tables 21 and 22 for RIMS. Tables 7 and 21 depict how individuals perceived they changed their perceptions of the OA system. Tables 8 and 22 compare

user's perceptions to five questions before implementation and the same five questions after the implementation. The columns in Tables 7 and 21 include answers, frequency, percentage, and significance of the data. The columns in Tables 8 and 22 include the before/after questions, frequency, percentage, and significance of the data.

Steps for Investigative Question 3

To answer the third investigative question, what is the frequency of use for each office automation system, the data were again presented in tabular form. Tables 9 and 23 depict whether the system was a routine pattern of work, how often the system was used per week, and how many hours it was used per week. Users' comments on these issues were categorized by content and scores tallied. The data are arranged in columns of question, frequency, and percentage.

Steps for Investigative Questions 4 and 5

To answer the fourth and fifth investigative questions, what major factors impede or facilitate these office automation projects, the data are presented in Tables 10 and 11 for RAMS and Tables 24 and 25 for RIMS. Users' support is depicted in Tables 10 and 24 and factors facilitating or impeding OA in Tables 11 and 25. The columns in Tables 10 and 24 include the questions, frequency, and percentage for the data. Tables 10 and 24 depict who the users go to for the most support and their satisfaction with the answers

they received. Tables 11 and 25 include columns for the questions, frequency, percentage and significance of the data. Users' comments were tallied and a determination made of the frequency of each factor to determine which factors have the largest impact. Tables 11 and 25 depict a general list of factors that affect OA projects and the users responses to those factors.

Steps for Investigative Question 6

To answer the sixth investigative question, how much change did RAMS/RIMS bring into the work environment of the information management personnel, the data are arranged in Table 12 for RAMS and Table 26 for RIMS, representing the amount of organizational change brought on by the OA system. Columns include the questions, frequency, percentage, and significance of the data. The responses were tallied and a determination made of the significance of each item with respect to change within the organization. Tables 12 and 26 depict how much individual and organizational change was introduced by the OA systems.

Steps for Investigative Question 7

To answer the seventh investigative question, is there a difference in the receptivity of office automation systems between managers and clerical workers, the data are arranged in Table 13 for RAMS and Table 27 for RIMS, representing manager and clerical worker responses. The columns of

Tables 13 and 27 include the title, mean, sample size, degrees of freedom, and probability of data results. Tables 13 and 27 reflect responses given by managers and clerical workers to the initial questions in the questionnaire from investigative question one.

Steps for Investigative Question 8

To answer the eighth investigative question, are there any perceived additional benefits to the office automation systems, a content analysis from responses to a direct question about perceived additional benefits of the OA system was used and a summary of statements obtained. Table 14 for RAMS, and Table 28 for RIMS depict responses to a question about improved promotion opportunity. Table 14 for RAMS and Table 28 for RIMS contain the question, frequency and percentage of responses. Perceived benefits were considered in making recommendations for functional users of RAMS and RIMS.

Summary

Previous chapters presented the problem statement, investigative questions, and review of the literature. Chapter III outlines the procedures used to analyze and develop the data collected from 40 personal interviews conducted for this thesis. The data collection procedures, data analysis procedures, and specific steps for answering each investigative question are outlined.

The findings from analysis of the data are found in Chapter IV.

IV. Findings and Analysis

Overview

This chapter details the statistical results of the responses to the questionnaire used in interviewing 40 information management personnel. Previous chapters presented the background and methodology for studying RAMS and RIMS impact on information management personnel. Chapter IV analyzes the collected data with the results broken down by OA system, first analyzing RAMS, and then analyzing RIMS. Statistical results are displayed in 28 tables and open ended questions are discussed by topic. Questionnaire interviews were determined to be most appropriate to collect both quantitative and qualitative data required to describe the impact of RAMS and RIMS.

The response analysis is grouped according to the four sections of the questionnaire. The sections of the questionnaire are analyzed by the following areas: demographic information, receptivity of the system, productivity, and additional items. Data from each section of the questionnaire are reported in tables which have a general discussion of frequencies, percentages, and significance. The significance level in the tables reflects the confidence or significance that can be expressed for that question. A significance level of 90 percent has been

chosen for this thesis. Open-ended questions are addressed at the end of the chapter.

RAMS Analysis

Respondent Demographics. Part I of the questionnaire asked for demographic information about information management personnel. The five items include: present job title, time worked in this job, time in their respective unit, age, and computer experience. The frequency breakouts and general discussion of each demographic variable follow.

Present Job Title. The respondents to this questionnaire interview were called prior to the interview to determine if the interviewee was a manager or clerical worker. This allowed an even frequency distribution of respondents for statistical comparisons. Managers could work directly with the system but had to supervise at least one other person using RAMS. Clerical workers worked directly with RAMS but did not supervise other users of RAMS. Table 1 shows the present job title, frequency, and percentage of interviewees.

One interesting item noted during the interviews was RAMS users did not like to be called clerical workers. They saw themselves as more than clerical workers because of their expertise in working with RAMS. The users preferred to be recognized by their professional military rank or specific civilian position.

Table 1
Present Job Title

| Title | Frequency | Percentage |
|-----------------|-----------|------------|
| Manager | 10 | 50 |
| Clerical Worker | <u>10</u> | <u>50</u> |
| | 20 | 100 |

Time on the Job. All respondents had to have over six months job experience working with RAMS to ensure sufficient experience to answer the questions. All respondents were asked this question on the initial phone contact and again for each interview.

Time in the Unit. Of the 20 interviewees, 13 or, 65 percent had over 2 years experience on the job. Only 3 or, 15 percent had less than six months in their present unit, but more than 6 months experience with RAMS. Experience they had gained elsewhere in RAMS was counted in determining if the interviewees had enough experience to be interviewed. Time in the unit, frequency and percentage of interviewees are shown in Table 2.

Age. Table 3 shows that only 5 percent of the interviewees were in the 18-25 age category. Forty percent were in the 26-35 category, 30 percent in the 36 to 45 category, 10 percent in the 46-55 category and 15 percent in

Table 2
Time in the Unit

| Time | Frequency | Percentage |
|-----------------|-----------|------------|
| 1-6 months | 3 | 15 |
| 6 months-1 year | 1 | 5 |
| 1-2 years | 3 | 15 |
| 2 years or more | <u>13</u> | <u>65</u> |
| | 20 | 100 |

the over 55 category. The frequency distribution of interviewees by age is shown in Table 3.

Table 3
Age of Interviewees

| Age | Frequency | Percentage |
|---------|-----------|------------|
| 18-25 | 1 | 5 |
| 26-35 | 8 | 40 |
| 36-45 | 6 | 30 |
| 46-55 | 2 | 10 |
| Over 55 | <u>3</u> | <u>15</u> |
| | 20 | 100 |

Computer Experience. Average computer experience of interviewees, as shown by Table 4, is well above two years. Only two people had less than one year of computer

experience. Fully 45 percent had 2 to 3 years computer experience and 45 percent had over 3 years experience.

Table 4
Computer Experience of Interviewees

| Time | Frequency | Percentage |
|--------------------|-----------|------------|
| None | 0 | 0 |
| 6 months or less | 0 | 0 |
| 6 months to 1 year | 2 | 10 |
| 1 to 2 years | 0 | 0 |
| 2 to 3 years | 9 | 45 |
| Over 3 years | <u>9</u> | <u>45</u> |
| | 20 | 100 |

Receptivity of RAMS Prior to Implementation. The second part of the questionnaire, containing questions 6 through 24, addressed when and how the system was announced, and the receptivity of RAMS prior to its implementation and after the implementation. The Coefficient Alpha (Cronbach Alpha Coefficient) for questions 8 through 12 was computed at .82, and .59 for questions 14 through 18, well within the range of acceptability. Specifically, questions 8 through 18 asked respondents if they agreed or disagreed with the statements presented. Responses were on a five point scale with 1 being strongly agreed, and 5, strongly disagreed. Eight of the respondents were not in the unit when the system was first announced. So, only 12 interviewees were

used to measure the receptivity to RAMS prior to the implementation. The second part of the questionnaire also addressed how RAMS was used in the users' daily jobs.

When and How RAMS was Announced. As shown in Table 5, 92 percent knew about RAMS at least 4 months prior to implementation. The majority of users learned of the implementation of RAMS through their supervisor or in a formal manner.

Table 5
RAMS Introduction

| Question | Responses | Frequency | Percentage |
|----------------------------------|----------------------|-----------|------------|
| First found out about the system | When it came in | 0 | 0 |
| | 1 to 3 months before | 1 | 8 |
| | 4 to 6 months before | 8 | 67 |
| | 6 months or more | <u>3</u> | <u>25</u> |
| | | 12 | 100 |
| How found out about the system | Supervisor | 7 | 58 |
| | Formally | 4 | 33 |
| | Informally | 1 | 8 |
| | Other | <u>0</u> | <u>0</u> |
| | | 12 | 99 |

Note. Not all questions average 100 percent due to rounding error.

Receptivity Prior to Implementation. Table 6 refers to investigative question 1 concerning how receptive information management personnel were prior to the implementation. Questions 8 through 12 of the questionnaire

Table 6
Receptivity Prior to Implementation

| Question | Responses | Frequency | Percentage |
|---|--------------------|-----------|------------|
| Liked what they had heard about RAMS | Strongly Agreed | 5 | 42 |
| | Agreed | 3 | 25 |
| | Undecided | 3 | 25 |
| | Disagreed | 1 | 8 |
| | Strongly Disagreed | <u>0</u> | <u>0</u> |
| | | 12 | 100 |
| Liked what RAMS was supposed to do | Strongly Agreed | 2 | 17 |
| | Agreed | 10 | 83 |
| | Undecided | 0 | 0 |
| | Disagreed | 0 | 0 |
| | Strongly Disagreed | <u>0</u> | <u>0</u> |
| | | 12 | 100 |
| Believed there was a need for RAMS | Strongly Agreed | 4 | 33 |
| | Agreed | 6 | 50 |
| | Undecided | 2 | 12 |
| | Disagreed | 0 | 0 |
| | Strongly Disagreed | <u>0</u> | <u>0</u> |
| | | 12 | 100 |
| Believed RAMS would work in their section | Strongly Agreed | 1 | 8 |
| | Agreed | 10 | 84 |
| | Undecided | 1 | 8 |
| | Disagreed | 0 | 0 |
| | Strongly Disagreed | <u>0</u> | <u>0</u> |
| | | 12 | 100 |
| Liked the way RAMS was announced | Strongly Agreed | 1 | 8 |
| | Agreed | 10 | 84 |
| | Undecided | 1 | 8 |
| | Disagreed | 0 | 0 |
| | Strongly Disagreed | <u>0</u> | <u>0</u> |
| | | 12 | 100 |

were employed to answer this investigative question. The Coefficient Alpha for this block of questions was .82, well

within the range of acceptability. It should be noted that these questions were asked as an after-the-fact occurrence and is the users' opinions, not a measured result. The table shows a moderate degree of reception of RAMS prior to implementation. For each question, at least 67 percent of the interviewees were receptive to RAMS prior to the implementation. The frequency and percentage for each question is shown in Table 6.

Individuals' Perceptions. Table 7 references investigative question 2 about whether information managers' perceptions changed after the OA implementation. Question

Table 7
Individuals' Perceptions of Change

| Answers | Frequency | Percentage | Significance |
|-----------|-----------|-------------|--------------|
| Agreed | 8 | 66.7 | 81 |
| Disagreed | <u>4</u> | <u>33.3</u> | |
| | 12 | 100.0 | |

13 was employed to answer this investigative question. Sixty-seven percent of the individuals surveyed changed their perception of RAMS after its implementation. Using the sign test, with a sample size of 12, the confidence level is 81 percent that there is a difference in individuals' perceptions of changes in their attitudes after

implementation. This value is not high enough to meet the chosen significance of 90 percent for this thesis. Table 7 shows the frequency, percentage, and significance of each individuals perception of how their attitudes changed.

Perceptions Before/After Implementation. Table 8 also references investigative question 2 about individuals perceptions changing after the OA implementation. To answer this investigative question, questions 8 through 12 and 14 through 18 of the survey were employed. The Coefficient Alpha for these questions was .59, within the range of acceptability. This table supports the data in Table 7 that reactions toward RAMS have not changed significantly since the implementation. Using the sign test, with a sample size of 12, none of the compared items in this table met the required significance of 90 percent for this thesis. For questions 8 compared to 12, and questions 14 compared to 18, 58 percent or more of the RAMS users indicated no change in their attitudes. "Negative differences" to compared questions are the number of responses that were lower than responses before the implementation. "Positive differences" to compared questions are the number of responses that were higher after implementation than before the implementation. "No change" indicates the number of responses that had no change in the before and after questions. Only 12 respondents were used in this table because 8 of the 20 respondents were not present in the unit when RAMS was

Table 8

Users' Perceptions of Before/After Implementation

| Before/After | Frequency | Percentage | Significance |
|----------------------|-----------|------------|--------------|
| ----- | | | |
| Questions 8 and 14 | | | |
| Negative Differences | 3 | 25 | 50 |
| Positive Differences | 2 | 17 | |
| No Change | <u>7</u> | <u>58</u> | |
| | 12 | 100 | |
| Questions 9 and 15 | | | |
| Negative Differences | 0 | 0 | 75 |
| Positive Differences | 2 | 17 | |
| No Change | <u>10</u> | <u>83</u> | |
| | 12 | 100 | |
| Questions 10 and 16 | | | |
| Negative Differences | 4 | 33 | 81 |
| Positive Differences | 1 | 8 | |
| No Change | <u>7</u> | <u>59</u> | |
| | 12 | 100 | |
| Questions 11 and 17 | | | |
| Negative Differences | 3 | 25 | 50 |
| Positive Differences | 2 | 17 | |
| No Change | <u>7</u> | <u>58</u> | |
| | 12 | 100 | |
| Questions 12 and 18 | | | |
| Negative Differences | 4 | 33 | 81 |
| Positive Differences | 1 | 8 | |
| No Change | <u>7</u> | <u>59</u> | |
| | 12 | 100 | |

implemented. Refer to the questionnaire in Appendix B for the questions measured in this table.

Frequency of Use. Table 9 references
investigative question 3 about the frequency of use of the
OA system. Questions 22 through 24 of the questionnaire

Table 9
RAMS Frequency of Use

| Question | Frequency | Percentage |
|--|-----------|------------|
| Routine pattern of work | | |
| Yes | 16 | 80 |
| No | <u>4</u> | <u>20</u> |
| | 20 | 100 |
| How many times per week do you use the system | | |
| 1-3 | 2 | 10 |
| 4-6 | 2 | 10 |
| 7-9 | 0 | 0 |
| 10-12 | 1 | 5 |
| More than 12 | <u>15</u> | <u>75</u> |
| | 20 | 100 |
| How many hours per week | | |
| 1-3 | 5 | 25 |
| 4-6 | 2 | 10 |
| 7-9 | 4 | 20 |
| 10-12 | 1 | 5 |
| More than 12 | <u>8</u> | <u>40</u> |
| | 20 | 100 |

were employed to answer this investigative question.
Information management personnel reported using RAMS
routinely in their work 80 percent of the time. Seventy-
five percent of the time users reported using RAMS more than

12 times per week. Users reported using RAMS only 40 percent of the time more than 12 hours per week. The other users are fairly evenly distributed from 1 to 3 hours per week up to 12 hours per week.

Productivity. The third part of the questionnaire measured the productivity of RAMS. Specific items addressed were user support, and what items impede, facilitate, or are neutral to the use of RAMS. Also addressed was the amount of change brought about by RAMS in user's jobs.

Users' Support. Table 10 refers to investigative question 4 about factors impeding the OA system. Questions 25 and 26 were employed to answer this investigative question. The table shows users do not have a central contact they go to for support. Forty percent said they go to the program manager for support and 35 percent go to another source for support. When questioned further, users acknowledged the other source was the command representative for RAMS. Seventy-five percent of the users reported having their questions answered satisfactorily many times.

Work Environment of RAMS. Table 11 refers to investigative questions 4 and 5. Questions 28 through 50 of the questionnaire were employed to answer this investigative question. The Coefficient Alpha for this block of questions was computed at .76, well within the range of acceptability. The table shows factors that impede, facilitate, or are neutral to the RAMS work environment. Only those factors in

Table 10
Users' Support

| Question | Frequency | Percentage |
|---|-----------|------------|
| Whom do you go to for support | | |
| Supervisor | 5 | 25 |
| Users group | 0 | 0 |
| Program manager | 8 | 40 |
| Other | 7 | 35 |
| | <u>20</u> | <u>100</u> |
| Do you get your questions answered satisfactorily | | |
| Practically always | 8 | 40 |
| Many times | 7 | 35 |
| About half the time | 2 | 10 |
| A few times | 2 | 10 |
| Practically never | 1 | 5 |
| | <u>20</u> | <u>100</u> |

this table with a significance of 90 percent or greater are discussed. In Table 11, the significance is determined using the sign test. Here, significance means that the average response is significantly above or below neutral. With regard to investigative question five, several features were seen to facilitate or be neutral to the use of RAMS. These features include: response time, command/response language, menu, understanding the system and the concept, information and documentation, sufficient equipment, equipment capability, top management commitment, adequate planning, physical comfort, and competition between departments.

Table 11
RAMS Work Environment

| Question | Frequency | Percentage | Significance |
|---------------------------|-----------|------------|--------------|
| ----- | | | |
| Access to system | | | |
| Impedes | 2 | 10 | 94.53 |
| Facilitates | 8 | 40 | |
| Neutral | <u>10</u> | <u>50</u> | |
| | 20 | 100 | |
| Response time | | | |
| Impedes | 2 | 10 | 98.88 |
| Facilitates | 11 | 55 | |
| Neutral | <u>7</u> | <u>35</u> | |
| | 20 | 100 | |
| Command/Response language | | | |
| Impedes | 1 | 5 | 99.83 |
| Facilitates | 12 | 60 | |
| Neutral | <u>7</u> | <u>35</u> | |
| | 20 | 100 | |
| Error messages | | | |
| Impedes | 3 | 15 | 88.77 |
| Facilitates | 8 | 40 | |
| Neutral | <u>9</u> | <u>45</u> | |
| | 20 | 100 | |
| Online assistance | | | |
| Impedes | 3 | 15 | 63.67 |
| Facilitates | 5 | 25 | |
| Neutral | <u>12</u> | <u>60</u> | |
| | 20 | 100 | |
| Accessibility to support | | | |
| Impedes | 5 | 25 | 78.80 |
| Facilitates | 9 | 45 | |
| Neutral | <u>6</u> | <u>30</u> | |
| | 20 | 100 | |

Table 11 (Cont)

| Question | Frequency | Percentage | Significance |
|--------------------------------------|-----------|------------|--------------|
| ----- | | | |
| Menu | | | |
| Impedes | 1 | 5 | 99.97 |
| Facilitates | 15 | 75 | |
| Neutral | <u>4</u> | <u>20</u> | |
| | 20 | 100 | |
| Documentation | | | |
| Impedes | 6 | 30 | 50.00 |
| Facilitates | 5 | 25 | |
| Neutral | <u>9</u> | <u>45</u> | |
| | 20 | 100 | |
| Changes/Updates | | | |
| Impedes | 4 | 20 | 50.00 |
| Facilitates | 5 | 25 | |
| Neutral | <u>11</u> | <u>55</u> | |
| | 20 | 100 | |
| Understanding the system and concept | | | |
| Impedes | 1 | 5 | 99.95 |
| Facilitates | 14 | 70 | |
| Neutral | <u>5</u> | <u>25</u> | |
| | 20 | 100 | |
| Information and documentation | | | |
| Impedes | 2 | 10 | 98.07 |
| Facilitates | 10 | 50 | |
| Neutral | <u>8</u> | <u>40</u> | |
| | 20 | 100 | |
| Training and training materials | | | |
| Impedes | 4 | 20 | 86.66 |
| Facilitates | 9 | 45 | |
| Neutral | <u>7</u> | <u>35</u> | |
| | 20 | 100 | |

Table 11 (Cont)

| Question | Frequency | Percentage | Significance |
|-----------------------------------|-----------|------------|--------------|
| Sufficient equipment | | | |
| Impedes | 0 | 0 | 99.80 |
| Facilitates | 9 | 45 | |
| Neutral | <u>11</u> | <u>55</u> | |
| | 20 | 100 | |
| Equipment capability | | | |
| Impedes | 3 | 15 | 92.70 |
| Facilitates | 9 | 45 | |
| Neutral | <u>8</u> | <u>40</u> | |
| | 20 | 100 | |
| OPR support, service, maintenance | | | |
| Impedes | 3 | 15 | 63.77 |
| Facilitates | 5 | 25 | |
| Neutral | <u>12</u> | <u>60</u> | |
| | 20 | 100 | |
| Communication channels | | | |
| Impedes | 3 | 15 | 34.37 |
| Facilitates | 3 | 15 | |
| Neutral | <u>14</u> | <u>70</u> | |
| | 20 | 100 | |
| Top management commitment | | | |
| Impedes | 1 | 5 | 98.05 |
| Facilitates | 8 | 40 | |
| Neutral | <u>11</u> | <u>55</u> | |
| | 20 | 100 | |
| Adequate planning | | | |
| Impedes | 1 | 5 | 96.48 |
| Facilitates | 7 | 35 | |
| Neutral | <u>12</u> | <u>60</u> | |
| | 20 | 100 | |

Table 11 (Cont)

| Question | Frequency | Percentage | Significance |
|---|-----------|------------|--------------|
| ----- | | | |
| Fit with existing organizational arrangements | | | |
| Impedes | 3 | 15 | 88.77 |
| Facilitates | 8 | 40 | |
| Neutral | <u>9</u> | <u>45</u> | |
| | 20 | 100 | |
| | | | |
| Job security and career considerations | | | |
| Impedes | 0 | 0 | 89.06 |
| Facilitates | 5 | 25 | |
| Neutral | <u>15</u> | <u>75</u> | |
| | 20 | 100 | |
| | | | |
| Physical comfort | | | |
| Impedes | 0 | 0 | 98.44 |
| Facilitates | 6 | 30 | |
| Neutral | <u>14</u> | <u>70</u> | |
| | 20 | 100 | |
| | | | |
| Competition between departments | | | |
| Impedes | 1 | 5 | 99.+ |
| Facilitates | 0 | 0 | |
| Neutral | <u>19</u> | <u>95</u> | |
| | 20 | 100 | |
| | | | |

Organizational Change. Table 12 references investigative question 6 about how much change the OA system brings into the work environment. To answer this investigative question, questions 51 through 57 of the survey were employed. The table lists the questions relating to change within the organization, frequency, percentage, and significance of each question. The

Table 12
Organizational Change

| Question | Frequency | Percentage | Significance |
|------------------------|-----------|------------|--------------|
| ----- | | | |
| Your responsibilities | | | |
| Negative Differences | 0 | 0 | 99.98 |
| Positive Differences | 12 | 60 | |
| No Change | <u>8</u> | <u>40</u> | |
| | 20 | 100 | |
| Demands placed on you | | | |
| Negative Differences | 0 | 0 | 99.98 |
| Positive Differences | 12 | 60 | |
| No Change | <u>8</u> | <u>40</u> | |
| | 20 | 100 | |
| Effort required of you | | | |
| Negative Differences | 4 | 20 | 96.16 |
| Positive Differences | 12 | 60 | |
| No Change | <u>4</u> | <u>20</u> | |
| | 20 | 100 | |
| Your job activities | | | |
| Negative Differences | 0 | 0 | 99.+ |
| Positive Differences | 15 | 75 | |
| No Change | <u>5</u> | <u>25</u> | |
| | 20 | 100 | |
| Your knowledge | | | |
| Negative Differences | 0 | 0 | 99.+ |
| Positive Differences | 18 | 90 | |
| No Change | <u>2</u> | <u>10</u> | |
| | 20 | 100 | |
| Your expertise | | | |
| Negative Differences | 2 | 10 | 99.96 |
| Positive Differences | 17 | 85 | |
| No Change | <u>1</u> | <u>5</u> | |
| | 20 | 100 | |

Table 12 (Cont)

| Question | Frequency | Percentage | Significance |
|--------------------------------------|-----------|------------|--------------|
| Your established work routines | | | |
| Negative Differences | 1 | 5 | |
| Positive Differences | 17 | 85 | |
| No Change | <u>2</u> | <u>10</u> | 99.99 |
| | 20 | 100 | |
| Same or higher accuracy and speed | | | |
| Negative Differences | 0 | 0 | |
| Positive Differences | 5 | 25 | |
| No Change | <u>15</u> | <u>75</u> | ** 99.+ |
| | 20 | 100 | |
| Improved individual work performance | | | |
| Negative Differences | 2 | 10 | |
| Positive Differences | 15 | 75 | |
| No Change | <u>3</u> | <u>15</u> | 99.88 |
| | 20 | 100 | |
| Improved unit work performance | | | |
| Negative Differences | 1 | 5 | |
| Positive Differences | 16 | 80 | |
| No Change | <u>3</u> | <u>15</u> | 99.88 |
| | 20 | 100 | |

Coefficient Alpha for this block of questions was computed at .76, well within the range of acceptability. For each survey question, the responses were compared with "no change in work atmosphere", subsequent to the implementation of RAMS. "Negative differences" indicate diminished responsibilities, expertise, demands, etc., after the implementation of RAMS, and is represented by a four or five

in the questionnaire. "Positive differences" indicate greater responsibilities, expertise, demands, etc., after the implementation of RAMS, and is represented by a one or two in the questionnaire. "No change" indicates the users did not perceive any change in their responsibilities, expertise, demands, etc., after the implementation of RAMS, and is represented by a three in the questionnaire. The sign test was used to determine the significance of items in this table. Only those items with a significance of greater than 90 percent are discussed in this thesis. Significance means the average response is significantly greater than or less than three (no change in responsibilities, expertise, demands, etc.). All items in this table have a significance of greater than 90 percent. Sixty percent reported their responsibilities, demands placed on them, and effort required of them to be greater than before RAMS was implemented. Although there is a statistical significant improvement in accuracy and speed due to RAMS, note from the table (**) that 75 percent of the respondents indicated no change in accuracy and speed. So, it is questionable whether a claim that RAMS increased accuracy and speed can be justified.

Additional Items Addressed. The final part of the questionnaire was for open ended questions where the users could add any additional responses they felt were important to the interview. Also, open-ended questions were asked in

each of the previous sections and will be reported in this section. Promotability was addressed because the literature reported OA workers perceived themselves as being more promotable because of their abilities. Because the questionnaire was addressed to two subgroups within the same group (managers/clerical workers), a two-sample T test was used to see if there was any difference in managers and clerical workers.

Manager and Clerical Worker Differences. Table 13 addresses investigative question 7 concerning the difference between manager and clerical workers' receptivity of the OA system. To answer this investigative question, questions 14 through 18 of the survey were employed. The answers were on a five point Likert scale with one being strongly agreed and five being strongly disagreed. To test whether there was any difference in the receptivity of RAMS by clerical workers and managers, a two-sample T test was run with the results listed in Table 13. The two-sample T test requires the assumption of normal populations for managers and clerical workers data. To meet the assumption of normality, the data for each question were summed for all clerical workers and all managers. For summed scores to be considered taken from a normal population, the scores from each population (i.e. manager, clerical) were tested using Cronbach Alpha. The individual Coefficient Alpha values were .79 for managers and .82 for clerical workers, well

Table 13
Manager/Clerical Worker

| Title | Mean | Sample Size | DF | Probability |
|----------|-------|-------------|----|-------------|
| Manager | 10.70 | 10 | 18 | 85 |
| Clerical | 9.70 | 10 | | |

within the range of acceptability. So we consider the scores to be from a manager population and clerical population, respectively. This indicates their scores are approximately normal. With a probability of 85 percent, the T test showed no significant difference in the reception of RAMS by managers and clerical workers. DF denotes degrees of freedom.

Promotion Opportunity. Table 14 addresses investigative question 8 concerning additional benefits of the OA system. To answer this investigative question, question 62 of the survey was employed. Eighty percent of the information management personnel felt their knowledge of RAMS did not improve their promotion opportunity. This was in contradiction to the literature on OA (22). Further questioning of RAMS users indicated that RAMS was not a part of promotion testing for military personnel and was not in the job description for civilian users. For those

Table 14
Promotion Opportunity

| Question | Frequency | Percentage |
|-------------------------------|-----------|------------|
| Improve promotion opportunity | | |
| Yes | 4 | 20 |
| No | <u>16</u> | <u>80</u> |
| | 20 | 100 |

individuals who did say RAMS helped their promotion opportunity, RAMS was a part of their job descriptions.

Open Ended Questions. Questions 19 and 20 addressed how OA personnel used RAMS in their daily jobs. RAMS users reported various uses of the system for every phase of their jobs including: tracking work requests, ad hoc reports, commercial printing, accounting, micrographics, monitor copier, personnel and equipment usage for manpower studies, and generating daily, weekly, monthly, and annual reports. Ad hoc requests were generated using dBASE III PLUS, a database management system for personal computers. The biggest problem users found was generating the annual report. Although the data may be entered for the entire year and monthly reports generated, the annual report requires the information be in a specific format. The data

that was entered during the year may not have been entered in this format.

Question 27 addressed productivity and what specific tasks RAMS accomplished easier, quicker or better, and what automated tasks take longer than those using a manual system. Users reported the annual report (when it works, again because of the data entry procedure), takes hours using RAMS instead of weeks using the manual system. Print orders were accomplished 80 percent faster using RAMS, job login and querring are 95 percent faster using RAMS, and at least a 45 percent savings in time using RAMS over the manual system. These percentages are the users opinions only and were not actually measured in this study. Problems users reported with RAMS were: too many screens, searches for some information was too slow, and unsatisfactory answers to questions they asked of the program manager's office. Users did not like having to go through the commands to get their questions answered. They preferred going straight to the source at the program manager's office for answers.

Question 37 addressed what kind of additional support users felt RAMS needed. The users expressed a variety of needs including networking capability for generating reports, contractor programming support instead of Air Force programmers, a full-time programmer just for RAMS, faster response time, more flexibility toward the end user, user

groups, and break out the copier module as a separate program for better user support. Some users that had experience with the civilian programmers of RAMS were happier with the service they received from personnel that did not leave every two to three years as military personnel are prone to do.

Question 61 and 63 addressed additional uses for RAMS and other comments. Making available an ad-hoc request generator within the program, put an "are you sure" statement in the logout procedure, and getting feedback before the end of the year when the annual report is due were also mentioned. Other comments included RAMS' ability to more easily produce annual reports. Users were not pleased with the annual report when they found the program did not properly calculate the report.

RIMS Analysis

Respondent Demographics. The same questionnaire used in the analysis of RAMS was used in the analysis of RIMS. The demographic data for RIMS is as follows.

Present Job Title. The respondents to this questionnaire interview were chosen specifically as managers or clerical workers prior to the interview. This allowed an even frequency distribution of respondents for statistical comparisons. Managers could work directly with the system but had to supervise at least one other person using RIMS. Clerical workers worked directly with RIMS but did not

supervise other users of RIMS. Table 15 shows the present job title, frequency, and percentage of interviewees.

One interesting item noted during the interviews was that RIMS users did not like being called clerical workers. They saw themselves as more than clerical workers because of their expertise in working with RIMS. The users preferred to be recognized by their professional military rank or specific civilian position.

Table 15
Present Job Title

| Title | Frequency | Percentage |
|-----------------|-----------|------------|
| Manager | 10 | 50 |
| Clerical Worker | <u>10</u> | <u>50</u> |
| | 20 | 100 |

Time on the Job. All respondents had to have over six months job experience working with RIMS to ensure they had sufficient experience to answer the questions. All respondents were asked this question on the initial phone contact and again for each interview.

Time in the Unit. Of the 20 interviewees, 11 or 55 percent had over 2 years experience on the job. Only 2 or 10 percent had less than six months in their present unit, but more than 6 months experience with RIMS.

Experience they had gained elsewhere in RIMS was counted in determining if the interviewees had enough experience to be interviewed. Time in the unit, frequency and percentage of interviewees are shown in Table 16.

Table 16

Time in the Unit

| Time | Frequency | Percentage |
|-----------------|-----------|------------|
| 1-6 months | 2 | 10 |
| 6 months-1 year | 5 | 25 |
| 1-2 years | 2 | 10 |
| 2 years or more | <u>11</u> | <u>55</u> |
| | 20 | 100 |

Age. Table 17 shows that only 10 percent of the interviewees were in the 18-25 age category. Fifteen

Table 17

Age of Interviewees

| Age | Frequency | Percentage |
|---------|-----------|------------|
| 18-25 | 2 | 10 |
| 26-35 | 3 | 15 |
| 36-45 | 7 | 35 |
| 46-55 | 6 | 30 |
| Over 55 | <u>2</u> | <u>10</u> |
| | 20 | 100 |

percent were in the 26-35 category, 35 percent in the 36 to 45 category, 30 percent in the 46-55 category and 10 percent in the over 55 category. The frequency distribution of interviewees by age is shown in Table 17.

Computer Experience. Average computer experience of interviewees, as shown by Table 18, is over one year. Fifty percent of the interviewees had over 2 years of computer experience.

Table 18
Computer Experience of Interviewees

| Time | Frequency | Percentage |
|--------------------|-----------|------------|
| None | 0 | 0 |
| 6 months or less | 0 | 0 |
| 6 months to 1 year | 7 | 35 |
| 1 to 2 years | 3 | 15 |
| 2 to 3 years | 3 | 15 |
| Over 3 years | <u>7</u> | <u>35</u> |
| | 20 | 100 |

Receptivity of RIMS Prior to Implementation. The second part of the questionnaire, containing questions 6 through 24, addressed the receptivity of RIMS prior to its implementation and after the implementation. The Coefficient Alpha for questions 8 through 12 was computed at .82, and .59 for questions 14 through 18, well within the range of acceptability. Specifically, questions 8 through

18 asked respondents if they agreed or disagreed with the statements presented. Responses were on a five point scale with 1 being strongly agreed and 5, strongly disagreed. Three of the respondents were not in the unit when the system was first announced. So, only 17 interviewees were used to measure their reception to RIMS prior to the implementation. The second part of the questionnaire also addressed how RIMS was used in the users daily jobs.

When and How RIMS was Announced. As shown in Table 19, 92 percent of the users knew about RIMS at least 4 months prior to implementation. Ninety-four percent of the

Table 19
RIMS Introduction

| Question | Responses | Frequency | Percentage |
|----------------------------------|----------------------|-----------|------------|
| First found out about the system | When it came in | 0 | 0 |
| | 1 to 3 months before | 3 | 18 |
| | 4 to 6 months before | 2 | 12 |
| | 6 months or more | <u>12</u> | <u>70</u> |
| | | 17 | 100 |
| How found out about the system | Supervisor | 8 | 47 |
| | Formally | 8 | 47 |
| | Informally | 1 | 6 |
| | Other | <u>0</u> | <u>0</u> |
| | | 17 | 100 |

users learned of the implementation of RIMS through their supervisor or in a formal manner.

Receptivity Prior to Implementation. Table 20 refers to investigative question 1 about how receptive information management personnel were to the implementation of the OA system. To answer this investigative question, questions 8 through 12 of the survey were employed. The Coefficient Alpha for this block of questions was .82, well within the range of acceptability. It should be noted that these questions were asked as an after-the-fact occurrence and is the users' opinions of their reactions, not a measured result. The table shows a moderate degree of receptivity by information management personnel for RIMS prior to implementation. For each question, at least 59 percent of the personnel interviewed were receptive to RIMS prior to the implementation. The frequency and percentage for each question is shown in Table 20.

Individuals' Perceptions. Table 21 references investigative question 2 about whether information managers' perceptions changed after the implementation of the OA system. Question 13 of the questionnaire was employed to answer this investigative question. Forty-seven percent of the individuals surveyed changed their perception of RIMS after the implementation. Using the sign test, with a sample size of 17, the confidence level is only 81 percent that there is a difference in individuals perceptions of changes in their attitudes after implementation. Table 21

Table 20
Receptivity Prior to Implementation

| Question | Responses | Frequency | Percentage |
|---|--------------------|-----------|------------|
| Liked what they had heard about RIMS | Strongly Agreed | 2 | 12 |
| | Agreed | 9 | 53 |
| | Undecided | 5 | 29 |
| | Disagreed | 0 | 0 |
| | Strongly Disagreed | <u>1</u> | <u>6</u> |
| | | 17 | 100 |
| Liked what RIMS was supposed to do | Strongly Agreed | 3 | 17 |
| | Agreed | 11 | 65 |
| | Undecided | 1 | 6 |
| | Disagreed | 1 | 6 |
| | Strongly Disagreed | <u>1</u> | <u>6</u> |
| | | 17 | 100 |
| Believed there was a need for RIMS | Strongly Agreed | 2 | 12 |
| | Agreed | 8 | 47 |
| | Undecided | 5 | 29 |
| | Disagreed | 1 | 6 |
| | Strongly Disagreed | <u>1</u> | <u>6</u> |
| | | 17 | 100 |
| Believed RIMS would work in their section | Strongly Agreed | 4 | 24 |
| | Agreed | 7 | 40 |
| | Undecided | 3 | 18 |
| | Disagreed | 3 | 18 |
| | Strongly Disagreed | <u>0</u> | <u>0</u> |
| | | 17 | 100 |
| Liked the way RIMS was announced | Strongly Agreed | 2 | 12 |
| | Agreed | 9 | 52 |
| | Undecided | 4 | 24 |
| | Disagreed | 2 | 12 |
| | Strongly Disagreed | <u>0</u> | <u>0</u> |
| | | 12 | 100 |

shows the frequency, percentage, and significance of individuals perceptions of how their attitudes changed.

Table 21
Individuals' Perceptions of Change

| Answers | Frequency | Percentage | Significance |
|-----------|-----------|-------------|--------------|
| Agreed | 8 | 47.1 | |
| Disagreed | 4 | 23.5 | |
| Undecided | <u>5</u> | <u>29.4</u> | 81 |
| | 17 | 100.0 | |

Perceptions Before/After Implementation. Table 22 also references investigative question 2 about individuals perceptions changing after the OA implementation. To answer this investigative question, questions 8 through 12 and 14 through 18 of the survey were employed. The Coefficient Alpha for this block of questions was .59, within the range of acceptability. The sign test, with a sample size of 17, was used to find the confidence level in changes of users attitudes after the implementation. With the exception of questions 10 and 16, Table 22 supports the data in Table 21 that reactions toward RIMS have not changed significantly since the implementation. Questions 10 and 16 reflected a significant positive change in attitudes about RIMS.

"Negative differences" to compared questions are the number of responses lower than responses before the implementation. "Positive differences" to compared questions are the number of responses higher after implementation than before the

Table 22

Users' Perceptions of Before/After Implementation

| Before/After | Frequency | Percentage | Significance |
|----------------------|-----------|-------------|--------------|
| ----- | | | |
| Questions 8 and 14 | | | |
| Negative Differences | 3 | 17.6 | 83 |
| Positive Differences | 7 | 41.2 | |
| No Change | <u>7</u> | <u>41.2</u> | |
| | 17 | 100.0 | |
| Questions 9 and 15 | | | |
| Negative Differences | 4 | 23.5 | 63 |
| Positive Differences | 6 | 35.3 | |
| No Change | <u>7</u> | <u>41.2</u> | |
| | 17 | 100.0 | |
| Questions 10 and 16 | | | |
| Negative Differences | 1 | 5.9 | 99 |
| Positive Differences | 9 | 52.9 | |
| No Change | <u>7</u> | <u>41.2</u> | |
| | 17 | 100.0 | |
| Questions 11 and 17 | | | |
| Negative Differences | 5 | 29.4 | 61 |
| Positive Differences | 7 | 41.2 | |
| No Change | <u>5</u> | <u>29.4</u> | |
| | 17 | 100.0 | |
| Questions 12 and 18 | | | |
| Negative Differences | 12 | 70.6 | 93 |
| Positive Differences | 5 | 29.4 | |
| No Change | <u>0</u> | <u>0.0</u> | |
| | 17 | 100.0 | |

implementation. "No change" indicates the number of responses that had no change in the before and after

questions. Only 17 respondents were used in this table because 3 of the 20 respondents were not present in the unit when RIMS was implemented. Refer to the questionnaire in Appendix B for the exact questions measured in this table.

Frequency of Use. Table 23 references investigative question 3 about the frequency of use of the OA system. Questions 22 through 24 of the questionnaire

Table 23
RIMS Frequency of Use

| Question | Frequency | Percentage |
|---|-----------|------------|
| Routine pattern of work | | |
| Yes | 19 | 90 |
| No | <u>1</u> | <u>5</u> |
| | 20 | 100 |
| How many times per week do you use the system | | |
| 1-3 | 6 | 30 |
| 4-6 | 7 | 35 |
| 7-9 | 4 | 20 |
| 10-12 | 3 | 15 |
| More than 12 | <u>0</u> | <u>00</u> |
| | 20 | 100 |
| How many hours per week | | |
| 1-3 | 3 | 15 |
| 4-6 | 4 | 20 |
| 7-9 | 2 | 10 |
| 10-12 | 3 | 15 |
| More than 12 | <u>8</u> | <u>40</u> |
| | 20 | 100 |

were employed to answer this investigative question. Information management personnel reported using RIMS as a routine pattern in their work 90 percent of the time. Eighty-five percent of the time users reported using RIMS nine times or less per week. Users reported using RIMS only 40 percent of the time more than 12 hours per week. The other users are fairly evenly distributed from 1 to 3 hours per week up to 12 hours per week.

Productivity. The third part of the questionnaire measured the productivity of RIMS. Specific items addressed were user support, what items impede, facilitate, or are neutral to the use of RIMS. Also addressed was the amount of change brought about by RIMS in users' jobs.

Users' Support. Table 24 refers to investigative question 4 about what factors impede the use of the OA system. Questions 25 and 26 of the questionnaire were employed to answer this investigative question. The table shows users do not have a central person or location that they go to for support. Forty percent said they go to the program manager for support and 55 percent said they go to another source for support. When questioned further, users acknowledged that the other source was the command representative for RIMS. Eighty percent of the users reported having their questions answered satisfactorily many times or practically always.

Table 24
Users' Support

| Question | Frequency | Percentage |
|---|-----------|------------|
| Whom do you go to for support | | |
| Supervisor | 1 | 5 |
| Users group | 0 | 0 |
| Program manager | 8 | 40 |
| Other | <u>11</u> | <u>55</u> |
| | 20 | 100 |
| Do you get your questions answered satisfactorily | | |
| Practically always | 7 | 35 |
| Many times | 9 | 45 |
| About half the time | 3 | 15 |
| A few times | 0 | 0 |
| Practically never | <u>1</u> | <u>5</u> |
| | 20 | 100 |

Work Environment of RIMS. Table 25 refers to investigative questions 4 and 5. Questions 28 through 50 of the questionnaire were employed to answer this investigative question. The table shows factors that impede, facilitate, or are neutral to the RIMS work environment. Only those factors in this table with a significance of 90 percent or greater are discussed. In table 25, the significance is determined using the sign test. Here, significance means that the average response is significantly above or below neutral. None of the items identified in this table were seen by users to specifically impede the use of RIMS. With

Table 25
RIMS Work Environment

| Question | Frequency | Percentage | Significance |
|---------------------------|-----------|------------|--------------|
| ----- | | | |
| Access to system | | | |
| Impedes | 1 | 5 | 99.07 |
| Facilitates | 15 | 75 | |
| Neutral | <u>4</u> | <u>20</u> | |
| | 20 | 100 | |
| Response time | | | |
| Impedes | 1 | 5 | 99.99 |
| Facilitates | 16 | 80 | |
| Neutral | <u>3</u> | <u>15</u> | |
| | 20 | 100 | |
| Command/Response language | | | |
| Impedes | 1 | 5 | 99.01 |
| Facilitates | 13 | 65 | |
| Neutral | <u>6</u> | <u>30</u> | |
| | 20 | 100 | |
| Error messages | | | |
| Impedes | 2 | 10 | 96.73 |
| Facilitates | 9 | 45 | |
| Neutral | <u>9</u> | <u>45</u> | |
| | 20 | 100 | |
| Online assistance | | | |
| Impedes | 1 | 5 | 99.73 |
| Facilitates | 11 | 55 | |
| Neutral | <u>8</u> | <u>40</u> | |
| | 20 | 100 | |
| Accessibility to support | | | |
| Impedes | 3 | 15 | 88.67 |
| Facilitates | 8 | 40 | |
| Neutral | <u>9</u> | <u>45</u> | |
| | 20 | 100 | |

Table 25 (Cont)

| Question | Frequency | Percentage | Significance |
|--------------------------------------|-----------|------------|--------------|
| ----- | | | |
| Menu | | | |
| Impedes | 3 | 15 | 98.24 |
| Facilitates | 12 | 60 | |
| Neutral | <u>5</u> | <u>25</u> | |
| | 20 | 100 | |
| Documentation | | | |
| Impedes | 1 | 5 | 99.68 |
| Facilitates | 11 | 55 | |
| Neutral | <u>8</u> | <u>40</u> | |
| | 20 | 100 | |
| Changes/Updates | | | |
| Impedes | 5 | 25 | 89.49 |
| Facilitates | 11 | 55 | |
| Neutral | <u>4</u> | <u>20</u> | |
| | 20 | 100 | |
| Understanding the system and concept | | | |
| Impedes | 0 | 0 | 99.99 |
| Facilitates | 14 | 70 | |
| Neutral | <u>6</u> | <u>30</u> | |
| | 20 | 100 | |
| Information and documentation | | | |
| Impedes | 2 | 10 | 98.88 |
| Facilitates | 11 | 55 | |
| Neutral | <u>7</u> | <u>35</u> | |
| | 20 | 100 | |
| Training and training materials | | | |
| Impedes | 4 | 20 | 91.02 |
| Facilitates | 10 | 50 | |
| Neutral | <u>6</u> | <u>30</u> | |
| | 20 | 100 | |

Table 25 (Cont)

| Question | Frequency | Percentage | Significance |
|-----------------------------------|-----------|------------|--------------|
| ----- | | | |
| Sufficient equipment | | | |
| Impedes | 3 | 15 | 92.70 |
| Facilitates | 9 | 45 | |
| Neutral | <u>8</u> | <u>40</u> | |
| | 20 | 100 | |
| Equipment capability | | | |
| Impedes | 4 | 20 | 91.02 |
| Facilitates | 10 | 50 | |
| Neutral | <u>6</u> | <u>30</u> | |
| | 20 | 100 | |
| OPR support, service, maintenance | | | |
| Impedes | 4 | 20 | 72.56 |
| Facilitates | 7 | 35 | |
| Neutral | <u>9</u> | <u>45</u> | |
| | 20 | 100 | |
| Communication channels | | | |
| Impedes | 6 | 30 | 62.30 |
| Facilitates | 4 | 20 | |
| Neutral | <u>10</u> | <u>50</u> | |
| | 20 | 100 | |
| Top management commitment | | | |
| Impedes | 2 | 10 | 98.07 |
| Facilitates | 10 | 50 | |
| Neutral | <u>8</u> | <u>40</u> | |
| | 20 | 100 | |
| Adequate planning | | | |
| Impedes | 5 | 25 | 61.28 |
| Facilitates | 7 | 35 | |
| Neutral | <u>8</u> | <u>40</u> | |
| | 20 | 100 | |

Table 25 (Cont)

| Question | Frequency | Percentage | Significance |
|---|-----------|------------|--------------|
| Fit with existing organizational arrangements | | | |
| Impedes | 5 | 25 | 70.95 |
| Facilitates | 8 | 40 | |
| Neutral | <u>7</u> | <u>35</u> | |
| | 20 | 100 | |
| Job security and career considerations | | | |
| Impedes | 1 | 5 | 98.93 |
| Facilitates | 9 | 45 | |
| Neutral | <u>10</u> | <u>50</u> | |
| | 20 | 100 | |
| Physical comfort | | | |
| Impedes | 2 | 10 | 94.53 |
| Facilitates | 8 | 40 | |
| Neutral | <u>10</u> | <u>50</u> | |
| | 20 | 100 | |
| Competition between departments | | | |
| Impedes | 1 | 5 | 68.75 |
| Facilitates | 3 | 15 | |
| Neutral | <u>16</u> | <u>80</u> | |
| | 20 | 100 | |

regard to investigative question five, several features were seen to facilitate or be neutral to the use of RIMS. The Coefficient Alpha for this block of questions was computed at .76, well within the range of acceptability. Several features were seen to specifically facilitate or be neutral to the use of RIMS. These features include: access to the system, response time, command/response language, error

messages, online assistance, menu, documentation, understanding the system and the concept, information and documentation, top management commitment, adequate planning, job security and career considerations.

Organizational Change. Table 26 references investigative question 6 about how much change the OA system brings into the work environment. Questions 51 through 57 of the questionnaire were employed to answer this investigative question. The Coefficient Alpha for this block of questions was computed at .76, well within the range of acceptability. The table lists the questions relating to change within the organization, frequency, percentage and significance level of each question. For each survey question, the responses were compared with "no change in work atmosphere", subsequent to the implementation of RIMS. "Negative differences" indicate diminished responsibilities, expertise, demands, etc., after the implementation of RIMS, and is represented by a four or five in the questionnaire. "Positive differences" indicate increased responsibilities, expertise, demands, etc., after the implementation of RIMS, and is represented by a one or two in the questionnaire. "No change" indicates the users did not perceive any change in their responsibilities, expertise, demands, etc., after the implementation of RIMS, and is represented by a three in the questionnaire. The sign test was used to determine the significance of items in

Table 26
Organizational Change

| Question | Frequency | Percentage | Significance |
|------------------------|-----------|------------|--------------|
| Your responsibilities | | | |
| Negative Differences | 0 | 0 | |
| Positive Differences | 17 | 85 | |
| No Change | <u>3</u> | <u>15</u> | 99.+ |
| | 20 | 100 | |
| Demands placed on you | | | |
| Negative Differences | 2 | 10 | |
| Positive Differences | 14 | 70 | |
| No Change | <u>4</u> | <u>20</u> | 99.79 |
| | 20 | 100 | |
| Effort required of you | | | |
| Negative Differences | 2 | 10 | |
| Positive Differences | 14 | 70 | |
| No Change | <u>4</u> | <u>20</u> | 99.79 |
| | 20 | 100 | |
| Your job activities | | | |
| Negative Differences | 1 | 5 | |
| Positive Differences | 16 | 80 | |
| No Change | <u>3</u> | <u>15</u> | 99.88 |
| | 20 | 100 | |
| Your knowledge | | | |
| Negative Differences | 0 | 0 | |
| Positive Differences | 17 | 85 | |
| No Change | <u>3</u> | <u>15</u> | 99.+ |
| | 20 | 100 | |
| Your expertise | | | |
| Negative Differences | 1 | 5 | |
| Positive Differences | 15 | 75 | |
| No Change | <u>4</u> | <u>20</u> | 99.97 |
| | 20 | 100 | |

Table 26 (Cont)

| Question | Frequency | Percentage | Significance |
|--------------------------------------|-----------|------------|--------------|
| Your established work routines | | | |
| Negative Differences | 1 | 5 | |
| Positive Differences | 12 | 60 | |
| No Change | <u>7</u> | <u>35</u> | 99.83 |
| | 20 | 100 | |
| Same or higher accuracy and speed | | | |
| Negative Differences | 3 | 15 | |
| Positive Differences | 13 | 65 | |
| No Change | <u>4</u> | <u>20</u> | 98.04 |
| | 20 | 100 | |
| Improved individual work performance | | | |
| Negative Differences | 4 | 20 | |
| Positive Differences | 14 | 70 | |
| No Change | <u>2</u> | <u>10</u> | 98.46 |
| | 20 | 100 | |
| Improved unit work performance | | | |
| Negative Differences | 3 | 15 | |
| Positive Differences | 14 | 70 | |
| No Change | <u>3</u> | <u>15</u> | 99.46 |
| | 20 | 100 | |

this table. Only those items with a significance of greater than 90 percent are discussed in this thesis. Significance means the average response is greater than or less than three (no change in responsibilities, expertise, demands, etc.). All items in this table have a significance of greater than 90 percent. Sixty percent reported their established work routines to be greater than before RIMS was

implemented. Sixty-five percent said they accomplished their work with the same or higher accuracy and speed. Seventy percent reported greater demand placed on them, improved individual work performance, and improved unit work performance after RIMS was implemented. Seventy-five percent reported their expertise to have increased and 80 percent said their job activities had increased. Eighty-five percent stated their responsibilities and knowledge had increased.

Additional Items Addressed. The final part of the questionnaire was for open-ended questions where the users could add any additional responses they felt were important to the questionnaire. Also, open-ended questions were asked in each of the previous sections and will be reported in this section. Promotability was addressed because the literature reported OA workers perceived themselves as being more promotable because of their abilities. Because the questionnaire was addressed to two subgroups within the same group (managers/clerical workers), a two sample T test was used to see if there was any difference in managers and clerical workers.

Manager and Clerical Worker Differences. Table 27 addresses investigative question 7 concerning the difference between manager and clerical workers' reception of the OA system. Questions 14 through 18 of the questionnaire were employed in this test. The answers were on a five point

Table 27
Manager/Clerical Worker

| Title | Mean | Sample Size | DF | Probability |
|----------|-------|-------------|----|-------------|
| Manager | 12.20 | 10 | 18 | 89 |
| Clerical | 9.90 | 10 | | |

Likert scale with one being strongly agreed and five being strongly disagreed. To test whether there was any difference in the reception of RAMS by clerical workers and managers a two-sample T test was run with the results listed in Table 27. The two-sample T test requires the assumption of normal populations for manager and clerical worker data. To meet the assumption of normality, the data for each question were summed for all clerical workers and all managers. For summed scores to be considered taken from a normal population, the scores from each population were tested using Cronbach Alpha. The individual Coefficient Alpha values were .94 for managers and .63 for clerical workers, well within the range of acceptability. So we consider the scores to be from a manager and a clerical population, respectively. This indicates the scores are approximately normal. With a probability of 89 percent, the T test showed no significant difference in the reception of

RIMS by managers and clerical workers. DF denotes degrees of freedom.

Promotion Opportunity. Table 28 addresses investigative question 8 concerning additional benefits of the OA system. Question 62 of the questionnaire was

Table 28

Promotion Opportunity

| ----- | | |
|-------------------------------|-----------|------------|
| Question | Frequency | Percentage |
| ----- | | |
| Improve promotion opportunity | | |
| Yes | 4 | 20 |
| No | <u>16</u> | <u>80</u> |
| | 20 | 100 |
| ----- | | |

employed to answer this investigative question. The table shows 80 percent of the information management personnel felt their knowledge of RIMS did not improve their promotion opportunity. This was in contradiction to the literature on OA (22). Further questioning of RIMS users indicated that RIMS was not a part of promotion testing for military and was not in the job description for civilian users. Of those individuals who did say RIMS helped their promotion opportunity, RIMS was a part of their job descriptions or they were aware of plans to include RIMS in promotion testing.

Open Ended Questions. Questions 19 and 20

addressed how users used RIMS in their daily jobs. RIMS users reported they used the system for every phase of their jobs including tracking training for personnel and staff assistance visits, annual, and monthly reports. Also, RIMS is used to produce file plans and file labels for all customer account representatives (CAR), and track FOIA requests.

Question 27 addressed productivity and what specific things RIMS accomplished easier, quicker, or better, and what tasks take longer. Users reported the annual report takes minutes instead of hours under the manual system. Users reported accomplishing file plans and labels at least 40 to 90 percent faster than using a manual system.

Large volume users of the FOIA program (over 100 requests per year) were not as happy with the FOIA program as were smaller volume users of the program. Small volume users did not spend as much time involved with using the FOIA program as did large volume users. In addition, some of the large volume FOIA users were previously using their own automated program that was developed in-house. These percentages are the users' opinions only and were not actually measured in this study. A benefit not measured in this questionnaire was to the unit Customer Account Representatives (CAR) that did not directly use RIMS. CARs are located in individual base units and have the CAR duty

as an additional duty. Previously, CARs had to develop and type each individual file plan and label. Under RIMS, the file plans and labels are produced by the computer, eliminating many tedious hours of researching regulations and typing forms.

Users did not like having to go through the parent commands to get their questions answered. They preferred going straight to the source at the program manager's office to get their questions answered.

Question 37 addressed what kind of additional support users felt RIMS needed. The users expressed a variety of needs including faster response time, flexibility toward the end user, users groups, better FOIA support, scroll up capability, exit capability from anywhere in the menus, capability to print more than one copy, compatibility with more computer systems, slow scroll screens for better viewing, and ad hoc request capability.

Question 61 and 63 addressed additional uses for RIMS and other comments. Users were pleased to have an automated system to replace the manual system, but wanted additional enhancements to the program. Ad hoc requests were the most often mentioned program enhancements desired by users. Users also suggested standardizing file plans by work center, have junior airmen do more of the testing for new versions, hands-on training for new personnel, command working groups for FOIA, more feedback for users.

enhancements for the staging area, and new versions that accommodate changes to the AFR 12-50 database that have already been made.

Summary

An equal number of clerical workers and managers were chosen as respondents to the questionnaire interviews to aide in statistical analysis for both RAMS and RIMS. The majority of the respondents had over two years experience in their current job for both RAMS and RIMS. Age was evenly spread between 18 and over 55 for both RAMS and RIMS personnel. Respondents' computer experience varied from six months to over two years with the majority having over two years experience for both systems.

Over 80 percent of the respondents knew about the systems at least 4 months prior to implementation and more than 90 percent were notified either formally or by their supervisor.

Receptivity of the systems by respondents prior to implementation was moderate for both RAMS and RIMS. Individual's perceptions of how their reactions changed since the implementation were not noted as significant for either RAMS or RIMS. Further questioning for RAMS revealed no significant change in perceptions, before verses after implementation. However, further questioning for RIMS revealed a significant change in perceptions, before verses after implementation. The significance arises because RIMS

users were not certain whether there was a perceived need for RIMS. Users are now more confident that there is a need for RIMS than they were before the implementation.

Respondents reported using RAMS and RIMS more than 80 percent of the time as a routine tool in their work. Because managers do not use the systems as often as clerical workers, the frequency of use in terms of hours per week was lower than it probably would have been with only clerical workers.

Both RAMS and RIMS respondents said they did not have a central person or location that they go to for system support. Respondents system support is generally either the program manager or command representative. Seventy-five percent or more of the respondents did get their questions answered satisfactorily. None of the items investigated impeded the systems, but several items were noted as specifically facilitating the systems. Items that facilitated the use of RAMS were: response time, command/response language, menu, understanding the system and the concept, information and documentation, sufficient equipment, top management commitment, adequate planning, physical comfort, and lack of competition between departments. Lack of competition between departments was over resources, both personnel and equipment. Items that facilitated RIMS were: access to the system, response time, command/response language, error messages, online

assistance, menu, documentation, understanding the system and the concept, information and documentation, top management commitment, adequate planning, and job security and career considerations.

Both RAMS and RIMS users reported significant change within their organizations. Sixty percent or more of the respondents reported their responsibilities, demands placed on them, and effort required of them to be greater than before the implementation. RAMS users reported their accuracy and speed in accomplishing their jobs to be about the same as before the implementation. In contrast, RIMS users reported their accuracy and speed in accomplishing their jobs to be higher than before the implementation.

Respondents for both RAMS and RIMS did not feel their knowledge of the systems helped their promotion opportunities. There was no significant difference found in the reception of RAMS and RIMS by clerical workers verses managers. Both RAMS and RIMS respondents were using the systems for all phases of their job.

The most significant problem found with RAMS was in generating the annual report. Large users (over 100 FOIA requests per year) of the FOIA program in RIMS were not satisfied with the performance of RIMS. Both systems increased speed of processing jobs from 45 to 90 percent. A common problem respondents discussed was having to address

their questions to the command before asking the program managers office.

Respondents said additional support for the systems should be networking capability, ad-hoc query capability, faster response time, and user support groups. Other comments indicated a general acceptance of the systems but a desire for enhancements to the programs, hands-on training for new users, feedback for users, and accommodation for changes to the AFR 12-50 database in RIMS.

V. Summary of Findings, Recommendations and Conclusions

Significance of Results

Little research has been accomplished prior to this effort in determining the impact of RAMS and RIMS on Air Force information managers. This research was developed to provide an initial base of knowledge about the OA programs affecting information managers in the Air Force. Programmatic research efforts could build on this basic research.

Information management personnel often work in jobs not directly related to the work that goes on at the base information management level. As a result, many information management officers become base information managers without a fundamental understanding of the responsibilities of their job or the systems they are responsible for. This thesis gives a broad view of two of those OA systems and the effects they have on information management personnel.

This study used a structured questionnaire to conduct interviews in determining the factors affecting Air Force middle managers and clerical workers in the information management career field. To determine these factors several investigative questions were addressed:

1. How receptive were information management personnel to the office automation systems (RAMS and RIMS)?

2. Were information management personnel's perceptions different from the period prior to installation of the office automation systems?
3. What is the frequency of use of each office automation system?
4. What major factors impede these office automation projects (RAMS/RIMS)?
5. What major factors facilitate these office automation projects (RAMS/RIMS)?
6. How much change did RAMS/RIMS bring into the work environment of the information management personnel?
7. Is there a difference in the reception of office automation systems in managers and clerical workers?
8. Are there any perceived additional benefits to the office automation system?

Investigative Question One. For both RAMS and RIMS the OA systems had a moderate degree of receptivity prior to implementation. At least 59 percent of RIMS personnel were receptive to the implementation whereas 67 percent of RAMS personnel were receptive to the implementation. The users of both systems were aware of the implementations at least four months in advance and learned of the implementation through their supervisor or in a formal manner. This is consistent with the literature (32) in ensuring personnel are aware of the planning process in conducting a successful implementation.

Investigative Question Two. Interview data indicate information management personnel perceived themselves as not having changed their perceptions 66.7 percent of the time for RAMS, and 47.1 percent of the time for RIMS. Further

questions supported users' belief that their reactions had not changed significantly since the implementation. The significance of these questions was low due to the number of personnel not present during the implementation phase of the systems.

Investigative Question Three. RIMS was used as a routine pattern in the work of information management personnel 90 percent of the time. RAMS was used 80 percent of the time as a tool for users' work. RIMS users used the program 9 times or less per week but RAMS users reported using the program more than 12 times per week. These figures indicate the overall use of both systems is good. The systems are successful because they are being used and not being abandoned. As later investigative questions show, there are weaknesses in the programs that need addressing, but overall the systems are functioning as planned.

Investigative Question Four. This study found no major environmental factors to specifically impede the two OA systems, RAMS and RIMS. However, the users did not have a central person to go to for answers to their questions. Each command has a central point of contact, but users often bypass the command representative to address questions directly to the program managers office at Gunter AFB, AL. Users' groups are recommended at the command and base levels to provide more answers to questions by users themselves. Through the interviews, the researcher found many users

obtained answers to questions from other users. User groups could answer many of their own questions, help solve local problems, provide the program managers' office with minutes of the meetings, and reduce the number of inquiries to the program managers office.

Investigative Question Five. Items facilitating the use of RAMS were: response time, command/response language, menu, understanding the system and the concept, information and documentation, sufficient equipment, top management commitment, adequate planning, physical comfort, and competition between departments. Items facilitating the use of RIMS were: access to the system, response time, command/response language, error messages, online assistance, menu, information and documentation, top management commitment, adequate planning, and job security and career considerations. As can be seen, the two systems have similar characteristics that facilitate their use. The number of factors found to facilitate the use of the systems reflects an overall successful program of design, implementation, and maintenance.

Investigative Question Six. Both RAMS and RIMS brought significant change into the work environment of information management personnel. The respondents reported their responsibilities, demands placed on them, effort required of them, their job activities, job knowledge, expertise, and established work routines to be higher than before the

systems were implemented. The only difference in the amount of change that RAMS and RIMS brought was in the accuracy and speed of their work. RIMS users reported an increase in their accuracy and speed, whereas it could not be proved RAMS users had increased their accuracy and speed. The respondents also reported improved individual work performance, and improved unit work performance. These responses indicate a high level of change brought about by the systems and an increase in productivity.

Investigative Question Seven. There was no significant difference in the reception of RAMS and RIMS by managers and clerical workers in this study. Some managers personally worked with the OA systems and some did not. This may cause managers who work with the systems to view the OA systems in the same light as the clerical workers. A larger sample size may show a difference in the reception of the OA systems by managers and clerical workers.

Investigative Question Eight. One additional benefit reported in the literature (22) was the perceived increased promotion opportunity through use of the OA system. This study found users did not perceive themselves as more promotable because of their OA expertise. Further questioning revealed that most civilians did not have use of the OA system documented in their job descriptions and military personnel were not tested for promotion based on the OA systems.

Overall, users perceived RAMS and RIMS as meeting the needs of their jobs. Users were pleased to have an automated system instead of a manual system, but had several suggestions for improving the OA systems. These items included: ad hoc request capability, standardizing the file plans for RIMS, hands-on training for new personnel, users' groups for both systems at base and command levels, faster response time, breaking out the modules into separate programs, compatibility with more than one type of computer system, and an end-of-year report that worked consistently.

Conclusion

The basic thrust of this thesis was to assess the factors in OA systems affecting Air Force middle managers and clerical workers in the information management career field. As a point of reference, the two OA systems RAMS and RIMS were used to investigate this problem.

Both RAMS and RIMS have served to enhance the productivity of information managers. Specific factors enhancing each system were identified and reported in the analysis and results of this thesis. An overall picture of these two OA systems shows they are more successful than manual systems, but need to be enhanced in future versions.

Recommendations

From the research findings, a users' group at the base and command level for both RAMS and RIMS users would be most

beneficial for both users and the program manager. Many recommendations made by the users are already being implemented by the program manager. These items include developing a separate FOIA and copier program, and reprogramming the software to improve response time and ad-hoc request capability.

A second recommendation is for the Air Force to include, as planned, RAMS and RIMS in the promotion testing system for enlisted members. Also, for civilians, the use of RAMS and RIMS should be included in their job descriptions. Both instances would improve users' attitudes and opinions about using the systems and making them a success.

In addition, a users' group could be formed on Wright-Patterson AFB for both RAMS and RIMS and monitored for suggested changes and solutions to common problems for the two systems. Many users face common problems that have been solved by other users in the past and all users stand to gain from the experience of others. Wright-Patterson AFB has a large population of users for both RAMS and RIMS. RIMS users now include all offices with a customer account representative. This is as a result of a new version of RIMS that can be used by the CARS themselves to produce file plans and labels.

Future Research

This study has provided a basis for studying OA systems affecting Air Force information management personnel. This same survey could be used to study the factors affecting information management personnel from other OA systems such as the Publication and Distribution Office System and Personnel Concept III.

The OA systems were well-liked by personnel using the systems, but they had several suggestions to improve the systems. The next step would be to identify specific modules or program limitations and work with the program managers' office in modifying the systems.

The questionnaire used in this study could be modified and used as a mail survey to obtain a larger sample size and validate the results of the findings in this thesis. Several items that were not noted as significant could have been the result of a small sample size.

The Air Force stands to gain higher productivity from its workers through the use and study of OA systems such as RAMS and RIMS.

Appendix A: List of Questionnaire Reviewers

Alphabetical listing of the Air Force personnel who provided input to the questionnaire review:

Phillip Beard, Maj, recent AFIT graduate and thesis advisor for this thesis

Fraser Crow, AFIT/GIR graduate and Program Manager for RAMS and RIMS, Gunter AFB, AL

Jeff Daneman, associate professor of Quantitative Management and reader for this thesis

Carl Davis, Capt, course director for Research Methods, expert in developing and validating survey instruments

Summer Scott, Capt, AFIT/GIR student, former base Information Manager responsible for RAMS and RIMS oversight

D. J. McBride, Lt Col, program manager for the GIR program at AFIT and recognized expert in field of OA

Appendix B: Questionnaire



DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY
WRIGHT-PATTERSON AIR FORCE BASE OH 45433-6583

REPLY TO
ATTN OF: AFIT/LSG/GIR
SUBJECT: Office Automation Interview

TO: All Interviewees

1. One of the important jobs at AFIT is to accomplish research for the Air Force on different systems. I am asking your help in this essential activity.
2. You can give me valuable guidance by reviewing the attached questionnaire prior to the interview. Please mark your answers on the questionnaire when you read it and ask me any questions at the time of the interview. Your answers will be put on a standard answer sheet during the interview. Your careful consideration of the answers to these questions is vital to my research and will be used in making program changes benefiting you and the Air Force.
3. You may discuss your answers with your fellow workers and supervisor prior to the interview. Of course, all responses will be treated as confidential, and no individuals or organizations will be identified in use of this material unless you give me specific written permission to quote.
4. If you have any questions you may leave a message for me at 255-4437.

[Signature]
ROY C. COOK, Capt, USAF
AFIT Student
Information Resources Management
School of Systems and Logistics

1 Atch
Survey Packet

STRENGTH THROUGH KNOWLEDGE

Interview for
AUTOMATED OFFICE SYSTEM

I'd like to begin by asking a few questions on your background. This information will be used to obtain a picture of the "typical employee."

Present Job

1. What is your present job title?
1. Manager 2. Clerical worker 3. Other
2. Have you worked more than six months on this system? 1. yes 2. no
3. How long have you been in this unit? 1. 6 months or less 2. over 6 months to 1 year 3. over 1 year to 2 years 4. more than 2 years
4. How old are you? 1. 18-25 2. 26-35 3. 36-45 4. 46- 55 5. 55 or more
5. How much computer experience have you had? 1. none 2. less than 6 months 3. more than 6 months but less than 1 year 4. more than 1 year but less than 2 years 5. 2 to 3 years 6. more than 3 years

Now, let's talk about the automated office system. First let's go back to when you first heard the system was going to be installed. Throughout the remainder of the interview we will be referring to _____ as the system. Remember we are talking about when you first heard about the system.

The System

6. When did you first find out about the system? 1. When it came in
2. 1-3 months before 3. 4-6 months before 4. 6 months or more
7. How did you first hear about it? 1. supervisor 2. formally
3. informally 4. other

Would you have agreed or disagreed with the following statements?

- | | | | | |
|----------|--------|-----------|-----------|-----------|
| 1. | 2. | 3. | 4. | 5. |
| Strongly | Agreed | Undecided | Disagreed | Strongly |
| Agreed | | | | Disagreed |

8. I liked what I had heard about the system.
9. I liked what the system was supposed to do at the time.
10. I believed there was a need for this particular system.
11. The system would work quite well in this section.
12. I liked the way the information on the system was first announced.

13. My reaction toward the system has changed since I first heard about it?

Now let's talk about how you feel about the system now. Would you have agreed or disagreed with the following statements?

14. I have good things to say about the system.
15. I like what the system does for me.
16. There is a need for this system.
17. The system works quite well in this section.
18. I think the way the system was announced should be changed.

Now I would like to discuss how you use the system in your daily job.

19. Briefly describe what you use the system for on your job. (Probe: What parts of your job can you not use it for?)
20. What are the outputs/producibles of your job?
21. Is the system part of your routine pattern of work? 1. yes 2. no
22. How long have you been using the system? 1. 6 months or less 2. 6 months to 1 year 3. 1 to 2 years 4. more than two years
23. How many times per week do you use the system? 1. 1-3 2. 4-6 3. 7-9 4. 10-12 5. More than 12
24. On the average, how many hours per week do you spend using the system? 1. 1-3 2. 3-6 3. 7-9 4. 10-12 5. More than 12

Productivity

25. When you need help or information in using the system, whom do you go to? 1. supervisor 2. users group 3. program manager 4. other
26. Do you get your questions answered satisfactorily?

| | | | | |
|-------------|-------|------------|-------|-------------|
| 1. | 2. | 3. | 4. | 5. |
| Practically | Many | About Half | A Few | Practically |
| Always | Times | the Time | Times | Never |

27. What specific things does the system let you accomplish easier? Quicker? Better? (Probe: give examples) What tasks take longer? (Probe: give examples)

Now I have a list of characteristics of your work place environment and the system that I would like you to rate as to whether it impedes, facilitates or is neutral to the system. I would like you to use a 3 point scale where 1 represents impedes, 2 neutral and 3 facilitates.

- | 1.
Impedes | 2.
Neutral | 3.
Facilitates |
|---------------|---|-------------------|
| 28. | access to system | |
| 29. | response time | |
| 30. | command/response language - easy | |
| 31. | Error messages - helpfulness, understandable | |
| 32. | online assistance | |
| 33. | accessibility to someone from support | |
| 34. | menu - flexibility, constraints, tediousness, options | |
| 35. | documentation (users manual) - understandable, thorough | |
| 36. | changes/updates - compatibility with existing systems | |
| 37. | What kind of additional support do you feel the system needs? | |

Now I have a list of nonsoftware characteristics that affect the operation of the system. I would like you to rate them as to whether you consider them to impede, facilitate or are neutral to the system not working up to the ideal. I would like you to use a 3 point scale where 1 represents impedes, 2 neutral and 3 facilitates.

- | 1.
Impedes | 2.
Neutral | 3.
Facilitates |
|---------------|---|-------------------|
| 38. | understanding why the system was implemented and the concept behind the program | |
| 39. | information and documentation | |
| 40. | training and training materials | |
| 41. | sufficient equipment | |
| 42. | sufficient equipment capability | |
| 43. | OPR support, service, maintenance | |
| 44. | communication channels - vertical, horizontal, planning group | |
| 45. | top management commitment | |

- 46. adequate planning
- 47. fit with existing organizational arrangements
- 48. users' job security and career considerations
- 49. users' physical comfort
- 50. competition between departments over resources

For the following statements please indicate the level of change since the implementation using the five point rating scale of

- | | | | | |
|---------|----------|-------|----------|------------|
| 1. | 2. | 3. | 4. | 5. |
| Much | Somewhat | Equal | Somewhat | Not at All |
| Greater | Greater | | Less | |

- 51. Your responsibilities.
- 52. Demands placed on you.
- 53. The effort required of you.
- 54. Your job activities.
- 55. Your knowledge.
- 56. Your expertise.
- 57. Your established work routines.

Would you agree or disagree with the following statements?

- | | | | | |
|----------|--------|-----------|-----------|-----------|
| 1. | 2. | 3. | 4. | 5. |
| Strongly | Agreed | Undecided | Disagreed | Strongly |
| Agreed | | | | Disagreed |

- 58. I get my work accomplished with the same or higher accuracy and speed.
- 59. My overall impression of my individual work performance (effectiveness or productivity) has improved.
- 60. My overall impression of the unit's work performance (effectiveness) has improved.

Conclusion

- 61. What additional uses can you foresee? (If more, what uses must it support to be fully useful?)
- 62. Does your knowledge of the system improve your promotion opportunity? 1. yes 2. no

63. Do you have any other comments or questions about the system you would like to add to this interview?

THANK YOU FOR YOUR TIME IN COMPLETING THIS QUESTIONNAIRE

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Vita

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