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An Investigation into the Resistance Factors Associated with the Use of Computers in Office Automation

Norman L. Davis

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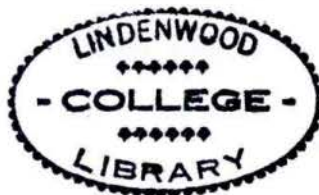
Norman L. Davis, B.S.

An Abstract Presented to the Faculty of the Graduate
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ABSTRACT

This thesis will investigate the resistance factors associated with the use of computers in automation.

Primary and secondary research has shown that high level employees and low level employees resist the use of computers in their work milieu. By studying the use of Electronic Mail, it has been shown that those employees who rank themselves as upper management resist using the computer resources available to them and those employees who rank themselves as lower management also demonstrate resistance. Those employees who rank themselves as middle management do not demonstrate such resistances.

This investigation, and the research that has preceded it, has indicated that the reasons for such resistance are different for each group. In the case of the upper management group the resistances were attributable to factors such as: 1) the relative age/maturity of the individuals is such that the group does not have the experience with computer applications that younger employees

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have, 2) analytical and communications applications of computer systems are typically performed by lower level managers who assemble data and information for senior management to review as part of the business decision process, 3) some upper level managers do not believe that it is in their range of responsibilities to type their own memos, and 4) some upper level managers do not know how to type.

In the case of the lower level employees (secretaries and clerks) the resistance factors were attributable to factors such as: 1) fear of the new technology in that the end user might demonstrate inability to comprehend and use the system, 2) job security is reduced, 3) the daily routine becomes disruptive, and 4) current social relationships must change.

Although there are several other reasons for resistance, the common denominator is the factors associated with resistance to change. In that regard, while the research has shown that the successful implementation of such systems requires top down management support and that adapting to new technologies may lead to advancement opportunities in the secretarial ranks, both groups resist the

technology.

Primary research was conducted by a survey in which employees of the Monsanto Chemical Company participated. The data which was produced indicated no significant correlation between the resistance factors of high and low level employees to Electronic Mail. Thus, the hypothesis has been rejected.

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A Culminating Project Presented to the Faculty of the
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DEDICATION

This work is dedicated to Micah. He set the standards for commitment, perseverance and courage. His struggle taught us that there is nothing in life that can not be tolerated.

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The author wishes to acknowledge the contribution and support of many friends, relatives business associates and academic advisors who, in various ways, contributed to the completion of this research effort and to the completion of the requirements for the degree of Master of Business Administration.

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The Thursday Night Running Club, who has had to
listen (and be bored by) the author's whining and
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Preface

Over the past several years computers and computer applications have moved out of the financial management department and into the offices of nearly every employee in the contemporary business organization. More and more business applications are being designed for routine computer tasks. Traditionally, these designs have taken the form of popular spread sheets, data bases, word processing programs and a very long list of ancillary support tools which, when applied in today's business environment, provide the contemporary business practitioner with resources designed to increase efficiency and productivity, save time and money, increase the accuracy of planning efforts, and streamline communications. This thesis will focus on the application of computers in the area of streamlined communications through the use of Electronic Mail (E-Mail).

Casual and unstructured observations in a business setting have shown resistance by some and acceptance of others to the computer and it's applications. More specifically, the observer's own department head (senior management) resists the use of the computer while, in general, the next lower level management group generally seems eager for the newest, the best

and the most sophisticated hardware devices and software programs. The department head uses his computer only to the extent of sending an E-Mail message (normally as a response to a message he has received from time to time) and his immediate boss never even turns his computer on.

It has also been observed that when there has been a change in the secretary's computer/word processing system, there is resistance to the change. Such resistance has been demonstrated by verbal complaints, anger, increased reliance on the "help desk" and temporary increases in "down time". These circumstances became painfully obvious when all of the offices were converted to on-line/automated word processing systems which left conventional typewriters behind forever. Several years later, when a newer word processing system was installed as the cornerstone of the Local Area Network, the secretaries showed renewed resistance by "acting out" in the same way as before. Their new stand alone, networked, Personal Computers (PC's) were greeted with renewed resistance.

Observation has demonstrated that resistance to use computers is evident at high levels and low levels of management while the employees in the middle management group are eager to adapt the technology. This paper will investigate whether or not resistance

to E-Mail (as a surrogate for contemporary office automation) is predictable in high and low level management groups and, if so, what are the factors causing the resistance.

Chapter I

INTRODUCTION

According to Gerrity and Rockert (25-34), after its early (ca. 1955-1964) accounting and clerical applications in the early stages of development, the use of information technology expanded between 1965-1974 to include direct support of many operational functions in the firm (e.g., manufacturing control and order entry). From 1975 on, relevant technology has been available for staff and managerial needs. While technology in earlier periods served paperwork or data processing needs of accountants, end user capabilities are now focusing on information, problem solving, and the communication needs of business personnel.

Unfortunately, in spite of the critical importance of end user computing, the appropriate method for managing it has not yet been developed in many companies. Although the benefits and potential benefits have been widely publicized, end users are often stuck with management techniques and processes developed during the early stages of development of computer applications (Gerrity and Rockert 25-34).

The "office of the future", according to Pava (1-12), has become the buzz phrase of scholars, consultants and entrepreneurs. Advertisements,

periodicals, and seminars pronounce new office systems and related equipment as the "incarnation of tomorrow's efficiency today." Yet, unfortunately, many issues that are crucial to the successful implementation of these new office systems and equipment are neglected. The enthusiasm for the new technology hides the concern for the necessary organizational learning and changes needed to make the new office systems most beneficial to the business enterprise. It is clear that the responsibility to confront and resolve the issues creates a challenge which initially rests with management, not with the promoters and experts in the technology. The challenge posed to management by the new office technology, such as E-Mail, requires both learning and change that is sufficient to reap the benefits from the new tools.

Ordinarily, organizational restructuring and cultural change are not discussed explicitly in conjunction with new office technology. Yet, too often, as Pava reports, the emphasis is restricted to the training of operators and the enhancement of procedures. Operator skill is undeniably necessary for the operation of the systems, and procedural guidelines are important to formatting data so that they can be used and transmitted. But the heavy emphasis on these levels of learning and change has given rise to a need

for user training which includes programs with self-teaching modules and dial-up phone services for user support. To minimize the need for procedural learning there is renewed emphasis upon specialized software packages aimed at narrow markets, an idea that closes the gap between traditional work routines and learning the way new programs work. However, it is extremely important that the learning does not stop with the "how to" effort. Substantial learning and change must occur throughout the organization in order for the new capabilities of advanced office systems and equipment to be translated into tangible benefits. When management fails to demand the necessary organizational learning and change, even the most sophisticated organizations will be unable to realize the potentially substantial benefits (Pava 1-12).

E-Mail Defined

E-Mail is not a technology in and of itself. It is a combination of software and hardware which is used for communications. E-mail software provides the ability to transmit and receive messages by an end user via a computer terminal. It is useless without the necessary hardware to create, receive, and transmit the messages. Thus, it is difficult to isolate software and hardware from the overall understanding of message

creation and transmission options. Since this paper is
not intended to be a technical analysis of the workings
of E-Mail, no effort will be made to describe these
complex issues. Instead, it will be sufficient to
provide appropriate information as to the use and
application of the systems which will provide enough
background and working knowledge for the reader.

E-mail has become an entirely new way of sharing
documents, graphics, and information. Spurred by the
growth of end user computing, data communications, and
application software standardization, E-Mail has
shifted from a stand alone resource used by small
groups to an important technology for information
processing, resource sharing, and group coordination.
Through E-Mail, and the applications integrated with
it, end users can adopt a new style of direct
communications with one another. For example, managers
can gain extraordinary tools for referencing and
recalling information and their subordinates can find
many new ways of receiving and transmitting data and
information throughout their organization. These
developments, when applied wisely, can be the
cornerstone of increased personal and departmental
productivity. (Datapro Research 1989)

E-Mail, in its broadest sense, encompasses all
types of electronic messaging. It includes facsimile

transmission (Fax), telex (TWX), mailgrams, computer conferencing, and voice mail (including everything between a simple answering machine to a state-of-the-art mainframe computer-based speech exchange network) transmission. Recently, E-Mail has been used more narrowly to describe messages transmitted between users of networked computers and is now being hailed as an important "enabling technology" for office communications. As E-Mail becomes increasingly more integrated with other office automation tools, it becomes easier (and more cost effective) to add value to information quickly and route it, in any form, to virtually any subscriber. Datapro Research, 1989)

E-Mail technology depends on two fundamental hardware components: a terminal and a communications network. Work stations can be either smart (containing a processor and capable of executing software -- such as a microcomputer), or dumb (without a processor and requiring a connection to a smart resource -- such as a mainframe, minicomputer or a microcomputer where the E-Mail software is applied) (Datapro Research 1989).

E-Mail and Traditional Information Delivery

The telephone is a poor substitute for E-Mail. It is an unreliable (there is seldom a guarantee that the person for whom a message is intended will be available

to receive the call) means of delivering high-priority messages and it is not concrete enough to consummate many business transactions since there is never a hard copy document produced. It is impossible to document verbal conversations precisely unless the conversations are recorded.

The postal service may have been the most significant reason E-Mail technology was developed. Based on the adage that "need is the mother of invention," general and long term dissatisfaction with slow, and often unreliable, mail service brought forth the new technology. E-Mail growth has been driven by the emerging need for instant delivery of information which was unavailable through traditional postal services. (Datapro Research 1989)

Courier services, whether local, regional or national, are, and always will be, very expensive, impractical to use on a regular basis and, unless hand delivered locally, no faster than overnight delivery.

Intracompany mail can sometimes be very aggravating and provide information delivery bottlenecks. Internal systems, laden with rigid distribution and pick-up schedules, high personnel turnover, and vulnerability to holiday and other work schedule anomalies, tend to make this alternative less desirable when considering streamlined information

transmission options.

In order for the system to be useful, there must be a substantial percentage of the members of the organization who subscribe to it and use it (it's not enough to subscribe, E-Mail must be used in order for it to be of value). If the number of subscribers and users are low, there will be little value realized. It is likely that deep frustration will be experienced by both subscriber and non-subscriber when either group tries to communicate with the other, not to mention the managers who had to agree to the expenditure prior to installation of the system.

Many people can use a telephone and mail a letter. Not everyone can use E-Mail. The (efficient and productive) use of computers and computer networks requires training and such training carries with it certain costs and significant time and emotional investments. It is clearly less expensive to use a telephone or mail a letter than it is to buy, install, learn to use and pay the associated fees (line charges, for example) that are intrinsic to computer networking. Also, a commitment to E-Mail also puts the end user in a position of being vulnerable to certain security risks related to a lack of privacy and a lack of control over the end user's data and information when compared to the more traditional methods of

communication. (Datapro Research 1989)

Caswell (1988) states that when further compared to more traditional communications options, E-Mail compresses the "event cycle" to between 1 to 2 hours from at least 24 hours (or more) for public mail systems and many couriers. E-Mail is closely associated with the telephone and physical mail systems, except messages are sent at the speed of light through the computer network in the exact form and structure desired. If the right E-Mail application is chosen, the value can be dramatic; that is, the benefit of decreased transmission time has both value-added and cost-displacement benefits for many organizations.

E-Mail offers more than just the direct benefits of improving the speed and regularity of transmitting information. For example, E-Mail reduces "telephone tag" (as long as the user checks the "mailbox" regularly), improves the productivity gains claimed by users of personal computers and other office automation systems (no "hard" dollars are saved unless there are manpower reductions -- the benefit is in the freeing up of the end user's time so that productive work can be accomplished), and improves communications -- especially when time zone differences make traditional telephone communications difficult (this benefit increases as the multi-regional, multi-national or

international structure of the organization changes).
E- Mail also improves the span of control over the
activities of subordinates (managers gain insight as to
the many separate communications that occur during
business cycles), improves knowledge of peer activities
(end users gain insight into each other's areas of work
without having to hold lengthy debriefing sessions),
improves group interaction and decision making (one
company noted a twenty-three percent improvement in the
productivity of their management and professional
staff), and allows fewer interruptions and better time
management by the subscribers (through a reduction in
the amount of paper mail, telephone calls, unscheduled
visits and certain types of meetings) (Caswell 1988).

Problems and Challenges

Although no medium can fully replace face-to-face
relationships, E-Mail has, as noted earlier,
significant and far reaching implications for
businesses and, therefore, demands a careful study of
its benefits by management prior to the financial and
human resource commitment. It is critical to obtain
the approval and support of top management, which means
being able to express the investment in familiar
business finance terms, such as "risk/reward ratio",
"net present value" and "internal rate of return".

Finally, once the investment is justified, there must be some method of measuring whether or not the investment was a wise one. In short, implementing E-Mail has as much to do with proper management protocols and techniques as it does with understanding the technology (Caswell 1988).

E-mail can be a powerful tool for improving office productivity. However, its full potential has not yet been realized. Technical problems (such as trying to get different systems to "talk" to each other) still stand in the way, and, even more significantly, a number of management problems have not been recognized or resolved in many E-Mail settings which will be discussed in detail throughout this paper. There are only six to eight million subscribers to E-Mail in the country, with, as one might expect, the greatest concentration being in the largest companies. Aside from system incompatibility, another reason for such sparse use is that there is not enough people in very many corporations who have access to the network. According to David Taylor (in Madlin 60-61) of the Gartner Group, a research firm in Stamford, CT., E-Mail users account for only one percent of large company's employees and there is potential growth to twenty percent over the next three years. The main obstacle to growth is not altogether technical. It takes a

coordinated management effort to plan and implement a wide spread link-up of end users within a large company. And, as to the coordination of various E-Mail systems, according to Madlin, if such commitments were a high priority in the first place, incompatibility problems would not exist.

Such problems have made it clear that businesses are not moving very rapidly toward the much sought after "paperless office". In fact, business seems to be going in the opposite direction; judging from all of the paper spewing out of laser printers, Fax machines and photocopiers. It appears that a complete information management strategy needs to include, among traditional issues, E-Mail and the handling of paper documents. Until recently, many information systems departments have concentrated on data processing which has traditionally involved processing structured data while, more and more, end users are wanting to computerize their communications requirements as well (Madlin 60-61).

User Resistance to Change

The real issue needing resolution is not related to the technical change. Instead, it is the human changes that accompany the technical innovations which draws attention. A large problem in business is the

resistance to such changes at all levels in the
organization. It is no longer proper to explain the
problem away by saying that "people naturally resist
change". Lawrence (4-12) stated that people do not
resist technical change as such and much of the
resistance which does occur is unnecessary. Through E-
Mail, for the first time, a very large and diverse
population has the opportunity to enter the computer
age. Such entry will naturally carry with it
resistance and it is becoming increasingly more
important to recognize, understand, and be able to
minimize such resistance. As to such resistance,
Lawrence makes five key points in his work. First,
what employees actually resist is not the technical
change. Instead, it is the social change -- the change
in their human relationships, that generally
accompanies technical change. Second, a way to
overcome change is to get people to participate in
making the change. Third, resistance occurs because of
certain blind spots and myopic attitudes which staff
specialists have stemming from their preoccupation with
the technical aspects of new ideas or systems. Fourth,
management should emphasize new standards of
performance. And fifth, top executives can bring focus
on issues related to change. In a group which Lawrence
studied where there was no employee participation in

the change, output dropped immediately to about two-thirds of its previous level. Resistance developed almost immediately after the change occurred, accompanied by marked aggression against management. Resistance to the change did not arise because of technical factors per se, but because of social and human factors (Lawrence 4-12, 166-175).

Lawrence implies that workers (read: end users) resist change while managers foster and implement change. Many of the changes associated with the growth of computer use have exposed the inadequacy of this assumption. That is, it is difficult to find many managers today who do not, at times, feel stress because of changes and who witness their own resistance levels running fairly high. We are all, at times, resistors as well as instigators of change. We are all involved on both sides of the process of adjusting to change. Resistance to change is not, by itself, good or bad and, importantly, such resistance may be justified and soundly based. It is, however, always an important signal calling for further investigation.

Change has both a technical and social aspect. The technical aspect of change is the making of a measurable modification in the physical routines of the job which computer systems, such as E-Mail, are sure to do. The social aspect of the change refers to the way

those affected by it think it will alter their established relationships and their position within their organization. Lawrence shows that, of the two episodes he describes, the variable which determines each result is the social aspect of the change. In other words, resistance was not shown to be to the technical change, as such, but rather to the accompanying change in the subject's human (social) relationships. The significance of Lawrence's research findings is that executives and staff experts do not need expertise or technical knowledge. What they need, instead, is a real understanding, in depth and in detail, of the employee's specific social arrangements that will be sustained or threatened by change, or by the way in which the change is introduced. In both of Lawrence's situations, the staff specialists involved did not take into account the social aspects of the change they were introducing. For different reasons they were preoccupied with the technical aspects of the change and they could not see (myopia) or understand what all the fuss was about (Lawrence 4-12, 166-175).

As noted earlier, the benefits of E-Mail can not be readily justified in terms of return on investment the way more traditional information systems are. Enhanced efficiency and effectiveness of an individual are often the only (and, more often than not,

unmeasurable) payoffs. Beyond such individual payoffs,
the real long term value of such computer applications
lies in the accelerated learning on the part of the
user about the user's job, about the user's discovery
of innovative new approaches to tasks, about
communications opportunities that can actually
transform the nature of the user's job and about the
new opportunities and limits of the technology itself.
Virtually every business is living in increasingly
turbulent and volatile marketplaces, and, as business
uncertainties increase, the value of manageable access
to good information also increases. There is clearly
immense potential value to develop and apply more
effective information technologies, such as E-Mail, to
enhance the prospects for achieving real competitive
advantage and contribute directly to improved
organizational effectiveness. End user professionals
are busy people. They make use of technology only when
it provides a direct, quick and pragmatic benefit to
getting their jobs done; usually by just doing some
things faster and better. Furthermore, many end users
operate under normal budgetary constraints and are
motivated to expend resources wisely. It is startling
to find cases where a manager, who has discretionary
spending control over millions of dollars is held
suspect for a considered purchase of a $3,000 personal

computer and associated software to use with it. Similarly, when new technologies become available, such as E-Mail, a lack of management support is equally demotivating (Garrity and Rockart 25-34).

Statement of Purpose

Business activities center on five basic tasks. They are: the collection of data, the evaluation of the data validity and reliability, the analysis of the data, the storage of the data and information, and the dissemination of the data and information. A computer network is a major cost and time saving factor in such business activities and its successful use is one of the most important ingredients in the success of the entire organization. There is a challenge to motivate employees to collect and transmit data; success, not surprisingly, depends on the ability of the managers of the organization to make the employees subscribe to such a computer network culture (Gilad and Gilad 53-61).

This study will investigate the possibility that, although the literature overwhelmingly supports the need for top down support of such computer systems and technologies, and, while the need for top down support is necessary, it is the top management group who resists the use of the systems most. Also, the lower

level members of the organization also resist computer
systems and technologies, but for different and
important reasons. This paper will attempt to clarify
the reason(s) why both groups tend to resist the
computer. Although the reasons for resistance may be
dramatically different, there must be an understanding
of what they are so that they can be eliminated.

Chapter II

LITERATURE REVIEW

Factors Relating to Social Aspects of Office Automation

There are several important factors relating to the hypothesis which must be examined. Research has shown that it is necessary to get top down management support in order to successfully implement and minimize or reduce resistance to computer systems. There is also research which shows that it is the top management of an organization who resists such systems. Also, the literature provides significant evidence that lower levels of the organization (e.g., secretaries) also resist such systems.

This section will review the differences between the top management and the secretarial ranks as to the reasons behind their resistances to end user computing (E-Mail).

In order to provide a coherent framework within which to understand these differences and the associated resistance factors, it is necessary to provide the reader with certain principals relating to the general subject of office automation and certain social aspects relating to the users of automated office systems. According to I/S Analyzer (1-16) employees could be helped by having their data and

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information in electronic form and, in that light, electronic data management is seen as the next step in automating corporate information. It is the elements of resistance to electronic data management that will be investigated in this thesis.

Garrity and Rockart state that for the past ten years the data processing profession has been slowly learning that the transfer of technology is one of its biggest problems. There has been a plethora of new hardware and software technologies, most of which are intended to increase the productivity of the end user; yet, these technologies are not being used (as was noted in the work by Madlin in many organizations and have achieved only modest results in many others (Garrity and Rockart 25-34).

Many facets of the computers' effects on organization structure have been studied. Probably the most frequently analyzed topic has been in the area of decision-making activities at different levels in organizations. For quite some time, many researchers have considered whether or not the computer leads to better decision-making and they have included, among other related topics, questions dealing with how the computer can effect a managers' span of control, the number of levels in the organization, the basis for organizing work, and the integrating and coordinating

mechanisms within organizations (Hofer 1970, Jackson 1970, Reif 1968, Shaul 1964, Sollenberger 1968 in Clowes). However, Clowes has found that regardless of the actual effects the computer may have on the overall organization; the perceptions and responses of the users, as differentiated by their job level, is significant in influencing behavior towards the computer system's development and use (Clowes 2-23).

Sproull and Kiesler (1492-1512) found the similar results that Clowes found. Sproull and Kiesler determined that a factor influencing resistances to the automated office is organizational position. Organizational position is defined as a person's location in an organizational department, hierarchy, and job category. Like geographic position, organizational position also predicts communication contact and content between users as independent of any other variables (O'Reilly and Roberts 1974 and Tushman and Romanelli 1983 in Sproull and Kiesler). It was found that information is more often exchanged within than across organizational units, chains of command, and job categories. This point, as determined by Sproull and Kiesler will be shown to be very important in evaluating the reasons why top management does not use (resists) end user computing. There are several variables that describe features of the communications,

such as the relationships among senders and receivers, the topic of the communication and the social conventions appropriate to the situation. For example, as Sproull and Kiesler report, when senders and receivers are of the same sex, race, and age, they contribute information more equally and their information is more equally valued than when they are dissimilar on these variables. The emotional compatibility and trust between senders and receivers also affects the content of what is communicated as does the topic of communication.

These social context issues influence information exchange through perception and communication behavior. According to Sproull and Kiesler (and reinforced by Clowes' findings), social context barriers, such as job level differences, will not inhibit communication if users are unaware of the status differences. It is not sufficient for people simply to hold different job levels; they must be aware of the fact that they are different in order for their communications to be inhibited. E-Mail is likely to weaken such social context cues since, when information is communicated via E-Mail, the only signs of the originator's position in the organization are names and addresses -- all else is missing (Sproull and Kiesler 1492-1512).

First (47-54) states that new computers mean a new

opportunity to work more efficiently. All to often, however, the new technology fails to bring the expected increase in productivity and the new computer (or new software) becomes a symbol of the unwanted, uncontrollable change in the employee's work lives and it can very likely trigger special anxieties during a period of transition.

Galitz (201-209) states, in a critically important article, that resistance towards change stems from eight key factors, or precursors:

Feelings of Inadequacy: Some people are anxious about their ability to learn the skills that end user computing requires. Levitt (1972 in Galitz) concludes that many people are far behind the technology and feel badly bruised by their failure to comprehend even simple computer technologies. For them, new technologies do not solve problems, they create them, and resistance to the technology follows.

Fear of Failure: Many workers spend years developing the skills that have made them proficient in their jobs. These workers will resist giving up their current practices (which give them a high degree of security) when they are confronted·with the unknown. New jobs that require learning new skills, adjusting to unfamiliar methods and operating procedures, and establishing new working relationships will cause

resistance.

Fear of the Unknown: People need to be able to predict what they will face in the future. Established patterns of behavior are known factors; while new systems, such as E-Mail, pose a threat and are resisted.

Habit: Established rules, policies and procedures frequently become habits which are relied upon for both guidance and protection. These habits provide a security blanket which is put at risk when change is implemented.

Loss of Control: People need a sense of control over their lives. Computer systems and new software programs are commonly seen as things over which one has no control. If a person perceives a loss of control or feels ignored or helpless, then resistance, anxiety, or depression may develop.

Disturbed Relationships: People have a strong need to interact with others. Changes that disrupt existing social patterns or result in user isolation can become unbearable. Such changes can also disturb worker relationships with the individual's management and often requires closer supervision which may cause a shift from a sense of independence to a sense of dependance.

Lack of Understanding: Resistance to change is

likely if workers do not understand the purpose behind the change.

Lack of Identification: A system should not be perceived as imposed. If the change is not initially sought by the workers and if the consequences of the change do not appear directly beneficial to them, then resistance is likely and the result will be a lack of identification and alienation from the system (Galitz 201-209).

Top Down Management Influences and Resistance Factors

Garrity and Rockart also found that senior management, in general, is not adequately informed and middle management, deluged with options, needs to understand technology through a well thought out education program and that astute leadership in end user computing will help create a competitive edge in the marketplace.

Some corporate realities, as stated by Bouldin are such that if you have the sanction of upper management in developing an end user computing system, then the users will be provided with the political incentive to cooperate, or at least listen, to proposals for new systems with an open mind. Bouldin (1989) says that successfully overcoming resistance to change is the secret to effecting the change. Furthermore, Bouldin goes on to say that the first sales pitch for a new

system has to be to upper management and that getting their commitment (at the highest level possible) is critical for political and concrete reasons. The high level sanction will assure an open-mindedness, minimum resistance and cooperation throughout the entire organization.

According to Caswell (223-238), there are no formal rules for planning and implementing E-Mail, however, Caswell states that one should look for users as high up in the organization as possible. Although end users may be convinced of the benefits of E-Mail, the breaking of old communication habits is a slow process and the more that can be done to make E-Mail visible so users know the systems are available for use, the higher the payback will be. If top management becomes committed to implementing E-Mail there is a ready solution to the problem of how to get it installed. As Caswell puts it: "If the CEO sends paper memos, then those down the line will send paper memos. If the CEO sends E-Mail messages, others in the organization will do so, too. The fastest way to get everyone in a company looking for E-Mail messages is to have the CEO start sending them."

In practice, according to Caswell, it may not be easy to implement such systems at the top because many executives will resist using the new technologies themselves; even though they may support their use by

everyone else in the organization. One of the key goals in implementing E-Mail will be to get top management to use the system on a daily basis. The difficulty Caswell identifies is that as long as E-Mail is seen as a clerical function (as noted by Sproull and Kiesler), typing messages is a social context clue which sends a very strong message regarding the doing of low level or clerical work) and as long as E-Mail does not provide key corporate information (the purpose of executive support systems), top management will resist it (Caswell 223-238).

Furthermore, Sproull and Kiesler asserts that common thinking concerning implementing computer system technologies is that a certain percentage of executives can not, or will not, type because they have no valid reason to learn how or to actually use the keyboard if they already know how to type (or, as Bouldin has found, may be politically unwise). Many executives do not acquire word processing and associated skills because they have secretaries that do their work for them. Furthermore, they also do not acquire spreadsheet or data base skills because their job is to review plans and analyses, not create them. The willingness to type by executives may increase if they had access to operations and corporate plans through their E-Mail systems (Sproull and Kiesler 1492-1512 and Bouldin 1989).

Another example of how top management influences the use of end user computer systems is found in Madlin's work which states that one important challenge a manager faces is to get the employees to use E-Mail effectively. Proven strategies for increasing use are the making sure that people can reach all of the employees they need to (if they can't, the system will always be underutilized), the including of interfaces between various internal systems (if there is more than one system being used), and the presence of a person in charge of keeping up the directory for all the systems and making sure it's up to date and easily accessible to all. Madlin reflects the findings of Bouldin and Caswell by stating that the quickest way to get people to use E-Mail is to get the boss to use it first. "If presidents of corporations or division managers make it clear that they expect E-Mail to be used and if they use it themselves," says Taylor of the Gartner Group, "All of a sudden, everybody else starts using it, too" (Madlin 60-61).

Lederer and Mendelow (525-534) note that recent research has shown that top management still needs to be convinced of the potential strategic impact of computer information systems. They explored the reasons for this need and the techniques by which information system executives attempt to convince top management of the positive impact of the systems and

has found that it is difficult to convince top management of the potential impact of information systems [read: E-Mail]. One finding was that sixteen out of twenty information systems managers indicated that they had experienced difficulty convincing top management of the potential strategic impact of information systems. Table 1 shows Lederer and Mendelow's "Reasons for Top Management's Reluctance to Recognize Strategic Impact of Information Systems":

Table 1

Reason	No. of Interviewees
Lack of Awareness	6
Sees only operation use of computers	6
Perceives credibility gap	5
Doesn't view information as a resource	4
Demands Financial Justification	3
Is Action-Oriented	2

Their table shows that many top managers lacked any involvement ("Lack of Awareness") in MIS early in their careers. Information technology was not widespread at that time and hence they had little or no contact with it when they worked at operating levels. Since information technology became widespread only after their promotions to positions of wide responsibility, many of the top managers do not realize the scope of the effect or breadth of the use of such systems. In fact, even if they experienced such

technology early in their careers, rapid changes in the
computer industry may have outdated their perceptions
of the potential of the technology and top management's
lack of familiarity with technology sometimes creates
anxiety when trying to relate to the issues associated
with it.   They are simply not comfortable with using
computers and do not like the discomfort (as Galitz and
First have found and has been noted earlier).
Moreover, they are reluctant to gain the necessary
knowledge.   After all, they reached their current
positions without it and they do not believe that it
will further their careers.

Lederer and Mendelow found that many top managers
see the computer as a necessary evil.   They view it as
necessary to increase the efficiency of operations by
reducing labor through transaction processing, but
perceive it as evil because of its exorbitant costs.
They do not believe that computer systems will
accomplish the stated goals because they have seen
previous systems fail to live up to expectations in
terms of benefits, costs, and implementation schedules;
i.e., previous systems have been oversold.   Also, top
management views information systems managers as
technical experts rather than business experts since
information does not have the same characteristics as
other resources used by the business.   Furthermore,
Lederer and Mendelow point out that management

decisions are based on a cost/benefit analysis and in information systems there are no well defined methods for identifying those ratios (a point which was made by Caswell earlier) (Lederer and Mendelow 525-534).

So far, this investigation has led to some interesting findings. The most significant one is that several other researchers are quite clear in their position as to the need for top management support in order to come up with a successful, well integrated end user computer system. Other researchers have indicated that the top management group has been found to resist computer technology. It is important to recognize this tension as a fundamental issue that needs to be resolved in this research.

According to Benjamin, Rockert, Morton and Wyman (3-10, hereafter known as "Benjamin et. al.") and Lederer and Mendelow, many senior managers have little or no experience (or background) in managing information and telecommunications technologies. Thus, these managers do not have an experiential base to relate the opportunity to their business. While many managers have focused on the basic technologies underlying their respective industries, far too many have missed the significance of the computer and communications technologies.

Kantrow (in Benjamin et. al.), argues that in order to exploit strategic opportunities arising from

technology, a senior management entrepreneurial attitude is required to view new technology as a central part of business thinking, examine how the key decisions of senior managers can be affected by the new technology, examine cross-functional organizational utilization of the technology, and consider the planning and production process required to exploit the technology.

Presently, an increasing number of companies are adopting this attitude with regards to the basic technologies that are relevant to their industries. However, evidence of this kind of thinking, with respect to information technology, was not seen in discussions with companies, many of which are in the multibillion dollar class, when Benjamin et. al. did the research. Out of their work came the following observations:

--Only a handful of companies demonstrated that managerial attention was focused on the potential impact of information technology on their corporate strategy.

--In many cases, this was a relatively new phenomenon, occurring for the first time in the past twelve to eighteen months prior to the research.

--Even where the technology was available at the corporate level, the managers which were interviewed believed that it was not being effectively included in

the planning process at lower levels.

The particular relevance of their study is that strategically oriented information technology applications can be generated at all organizational levels. In fact, many of the effective applications observed have been developed spontaneously at lower levels within the organization. They found that there are companies implementing systems of strategic importance. Some senior managements are acutely aware of the strategic potential of information technology and are leading the change.

Benjamin et. al. point out that senior executives need to be able to determine where the strategic opportunities exist for use of the technology. Many opportunities for strategic use of the technology (E-Mail) exist today and more are constantly emerging with the increasing flow of lower cost technologies that provide significant new capabilities. As competitive pressures grow, these opportunities are being seized. The researchers ask what steps, then, should senior management take to move the application of technology forward within the organization. The answer lies in the focusing of attention at the top of the organization and the generation of awareness of the potential advantages and incentives to apply it throughout the organization. Senior management, then, should work to create an environment in which

information technology is considered an important
strategic weapon (Benjamin, Rockart, Morton, and Wyman
3-10).

Rockart and Treacy (82-88) state, along the lines
of the earlier discussion relating to social context
clues (in Sproull and Kiesler), that improved computer
technology, coupled with a heightened analytic
orientation among top managers, is beginning to change
the pattern by which a company funnels information to
the top. Rockart and Treacy found that many top
managers still have no terminal-based access whatsoever
(as Taylor pointed out in Madlin's work). They find
the idea of working at a terminal a violation of their
managerial styles (which supports Sproull and Kiesler's
discussion regarding social context clues) and their
view of their jobs. They are perfectly comfortable
asking staff to provide both manual and computer
generated analysis as needed (as Lederer and Mendelow
found). Moreover, executive information systems (of
which E-Mail is an intrinsic part) provides no clear,
easily defined, cost savings (which, as Caswell pointed
out, is necessary for some top managers). In fact,
Rockert and Treacy know of no system that a traditional
cost-benefit study would justify in straight labor
saving terms. Why, then, Rockert and Treacy asks, are
managers implementing them in growing numbers?

They suggest that such systems offer assistance to

analytically oriented top executives in their search for a deeper understanding of their company and industry. They believe that many top managers are basically analytical and that they are both aware of the new tools and find them to their liking. Also they state that such systems can be structured to accommodate the information needs of the individual manager.

According to Rockart and Treacy, top manager's use of computers is spreading for three primary reasons: end user oriented terminal facilities are now available at an acceptable price; executives are better informed of the availability and capabilities of these new systems; and today's volatile competitive conditions heighten the desire among top executives for more timely information and analysis. Rockart and Treacy and Gremillion and Pyburn (130-137) have found that senior managers can play a major role in closing the information systems gap by fostering the establishment and implementation of new strategies for development of end user computer systems. In spite of the obvious benefits of alternative development approaches in certain circumstances, Gremillion and Pyburn found that direction from senior managers is sometimes necessary to get things moving when the group is hung up in the traditional model of systems development as was reflected by the work done by Benjamin et. al.,

Caswell, Bouldin, and Madlin (Rockart and Treacy 82-88 and Gremillion and Pyburn 130-137).

Alaba found that the many important people in the organization -- the highest level executives -- were the ones least likely to use the computer. The problem he found at American Cyanamid was that the highest level executives didn't have the time to learn complex computer rules (Alaba 196-198).

Buckland (1988) stated that senior management requires information for three areas of activity: monitoring the business (done routinely, in detail, by lower levels of management), analysis of trends (not always easily accomplished in large piles of output reports), and planning future efforts (to get a feel for the most likely effects from present decisions is a regular information need of executives). Senior executives do not usually make decisions based on the detailed information generated by computer systems (this point was also confirmed by Sproull and Kiesler. Rather, they are usually based on personal contacts and on their feelings about the validity of the recommendations from subordinates. Buckland also stated that the decision making patterns require the routine availability of operating results and a number of summaries and analyses generated from those results. However, it is important to recognize that the senior executives do not use the computer themselves, they

have others generating the data and information for them. It is clear why actual hands-on-the-keyboard would be resisted.

Buckland goes on to say that the corporate culture is essentially the management style of the organization. It puts firm bounds on what is expected from each manager. If managers step out of the type of work that is expected of them, they take great risks that their efforts will be rejected. As this point relates to the hypothesis, using E-Mail and other contemporary computer systems may put them at risk in their management's view. Galitz made this point quite well when the eight factors of resistance were listed and Bouldin reflected the political ramifications of such risks.

Many managers cannot visualize themselves as sitting at a terminal and using computer output to arrive at substantive decisions. They are not comfortable with the analysis, design, implementation, and use of such systems. They do not want to become familiar with such things, or spend time pressing keys (another reference to Lederer and Mendelow's work). They like to leave the analytical work to subordinates, and may even fear (as Galitz stated) the misuse of such a system. This is a real problem and can only be handled rapidly by starting with such systems at the top, then working down. If senior management does not

see that executive information systems and decision support systems (of which E-Mail is a necessary part) might be useful to their organization, then this particular game may be lost before it is started.   This is a particularly critical point. If a senior manager sees such a system working successfully, it will literally force many of the managers below to get similar computers or terminals, and to have access to the same information and communication network.   If they do not keep up with the technology, they will not be able to answer the questions posed to them with sufficient promptness, and they will not know exactly what figures their boss is using.   This will cause a heavy demand for systems installation and will demonstrate the point made by Taylor (in Madlin) and by Caswell earlier.

The existing corporate culture, therefore, will have a material effect on the introduction and development of such systems.   If the pressure is on because a senior manager has installed a successful system, opposition and resentment can build up. This can be softened by the providing of a great deal of support, hand-holding, and giving one-on-one instruction (Buckland 1988).

To make sure that the discussion regarding the tension between findings confirming the need for top down management support and top management's

resistances to end user computing has an international flavor, it is interesting to cite Finney's discussion of the use of lap top computers by business travelers. He notes that:

> ...a lot of personal-computer issues remain unresolved -- even after a decade of smarter and smarter machines coming on the market.
>
> One problem is psychological. A few years ago the aristocratic vice chairman of a leading French telecommunications company told me, somewhat despairingly, "The older managers in European industry just won't be seen using computers. Executive lose status when they're hands-on rather than hands-off, don't they? It'll take a whole new generation to make computers personal. You people in America are ahead of us in that respect."
>
> Not by much. Even today, few "senior executives" over 40 run around with laptop computer at the ready. "I've see only about a dozen people using laptops," Nancy Parkin, a 20 year veteran American Airlines cabin attendant, told me on a recent flight. "Some bring them along but don't open them." (Finney 1990)

Bottom Up Influences and Resistance Factors

According to First (47-54), even when given professional training employees often balk at using new systems effectively. As demonstrated earlier, change in the work place can be a frightening phenomenon. "Once we establish how we conduct our lives, we identify with those patterns," says Paul Kazmierski, Phd, Asst. Vice President of, and a Professor in, the Career and Human Resource Development Program at the

Rochester Institute of Technology in New York.   "Any
disruption can cause a sense of loss, leading to a
grief response."   He maintains that in some cases an
individual faced with change goes through some or all
of the four stages of bereavement that ideally
culminate in acceptance: denial, resistance, anger and
depression (First 47-54).

Technological change, precipitated by changes in
management -- a merger, acquisition or restructuring --
hits employees particularly hard.   New computer systems
or software can become symbols of the unwanted,
uncontrollable change in work lives.   Kazmierski: "We
have a cultural belief that people in authority are
insensitive to our needs.   If the sense is that the
change is imposed by an unseen authority, the automatic
response for many is that it can't be good for them."
That can make managers -- and their performance goals
with new equipment -- the focus of seemingly excessive
anger.   In addition to symbolizing the disturbing
nature of change itself, new hardware and software can
trigger special anxieties, especially during a period
of transition.   Some workers fear their jobs will be
taken away by new technology, while others worry that
it will require them to take on even more work -- more
than they may be able to handle.   "People like to feel
that they're the best at what they do.   Change
threatens that confidence.   They're concerned they

might not be able to do their old jobs well the new way," says Nancy Dedomenico (in First), manager of training and customer support at computer systems integrator Syntrex Inc. in Eatontown, New Jersey.

"Resistance can manifest itself as breaking the rules and attempting to get attention. The individual may go into states of depression and childlike behavior" says Kazmierski. Such regression can take the form of uncooperativeness or even vengeful and destructive actions, he warns (First 47-54).

As demonstrated earlier, Galitz found that new technologies will present dramatic changes to office personnel. People's roles, functions, responsibilities and relationships with each other will change, as will their working environment and how they accomplish work. Managing and coping with this change will require more than simply adapting to a new status quo. It will call for adapting to a continuing pattern of change. No meaningful precedents exist for the changeover process. It is filled with uncertainty. Introducing change in any organization is delicate, frustrating, potentially disruptive, time-consuming and costly. Many changes collide with established, familiar behavior patterns that are grounded in the strong, deep-seated habits and social relationships of people and organizations. Resistance to change is great, whether or not change is right or wrong (Diran 1978, Johnson, et. al. 1978,

Hackman 1976 and Levitt 1972, in Galitz).

Vessey and Tait (1-5) state that an appropriate climate for change is a necessity for user involvement. If the organization has a climate (as supported by the Buckland discussion regarding corporate culture, earlier) that is appropriate for the change, then less preparation of the environment is required. Accordingly, a smaller degree of employee participation will be required to ensure that the change is successful. Conversely, if the organizational climate is unsuitable for change, to avoid problems and increase the chance of a successful change, a large amount of preparation will be needed. Therefore, as Vessey and Tait have found, the amount of preparation of the environment required before a change is contingent upon the initial organizational climate and the size of the change in the user environment. As noted earlier, if management is demonstrating commitment to change, it will be easy. If not, it will be difficult. In either case, the lower level employees will get their cues from management.

E-Mail is another means by which people are going to see a more rapid flow of information. If there is an E-Mail message from the boss and it is known that the document was received at 9 a.m., then the boss could ask for the reply by 10 a.m. There could be a great deal more psychological pressure to respond at

the lower levels of the organization, not only because E-Mail gets there faster, but because of the pressure to respond which is inherent with the experience.

Vessey and Tait state that adding computer skills for the secretary includes the need to provide a knowledge of the commands and procedures required to use the system and the secretary must be familiar with, and benefit from, the results produced. Training and support becomes a matter of continuing concern and involvement. The secretary's boss must be aware of the attitudes and concerns of the subordinates who must work with each new modification to the office system. The boss must exercise strong influence on the design process and the implementation of the new systems which means that the boss must be involved in managing change. Of course, if the boss is not an end user, success with the subordinates will be difficult (Vessey and Tait 1-5).

A review of what has happened in the typical office shows that in the transition to the use of end user computer systems the secretary has made the change from the word processing system to the terminal with its associated minicomputer. The secretary uses the terminal to communicate with other locations, to schedule meetings, to retrieve documents, and has access to substantially more computing power than the programers who worked with the early computers. All of

this means that the secretary can be the beneficiary of considerable job enlargement. These changes can have the effect of justifying higher levels of job responsibility for the activities traditionally associated with those of the secretary and will raise the status and stature of the individual in this position (Kalow and Rosa 1984). As we have seen in Galitz's work, such changes may not be greeted warmly, in spite of the opportunity for promotion. It is wrong to think that everyone wants such increases in responsibility.

In Lueder (125-133), Braverman (1972) argues that computers frequently emphasize the negative aspects of office work. Also, a Rand report (as described by Lueder) concluded that many lower level operators feel that office automation invariably leads to more standardized and fragmented work, more formalized work processes, and more authoritarian forms of supervisory control (Bickson, Gutek, and Mankin 1981, in Lueder). Many have concluded that work in the electronic office is beginning to mimic production line processes. Braverman stated that office work, particularly work involving computers, is even more subject to creating standardized rules for the work by separating activities that involved various degrees of abstraction from routine and monotonous tasks because it is more amenable to simplifying office tasks than factory work.

Lueder reported that out of 130 occupations, the second highest incidence of stress-related disease is incurred by secretaries (Smith, Colligan and Hurrell 1977, in Lueder). Research from Sweden indicates that the job factors most closely associated with stress involve taxing, static-muscular (i.e. constraining) work loads, high sensory demands, and machine-paced time patterns (Ostberg 1984, in Lueder). Such factors frequently characterize the use of information systems by clerical staff. This is not to say that management does not also experience stress with the introduction of computers. Although the tasks of support staff may become more creative and professionals are assuming more responsibilities for decision making in the electronic office, management is increasingly taking on more routine tasks (Ellis 1985, in Lueder). The process of implementing information systems may also be stressful because they must assume risks and base decisions on limited information regarding its consequences over both the short and long term. There is a further concern that they may be replaced by others better versed in computers or may become redundant as many of their functions are taken over by computers (Lueder 125-133).

The most important influence over one's motivation to work is the amount of participation that is allowed in the work process. Those employees who participate

in their work are more satisfied with their work, have better self-esteem and relationships with their supervisors, and exhibit lower rates of absenteeism and turnover. Those not able to participate experience fears of job loss, depression, poor self-esteem, greater absenteeism and are more intent on leaving their job. When one is subjected to standardized work methods and processes, repetitious tasks over short time cycles that do not take advantage of one's skills, and work under isolation for extended durations (all of which could easily be associated with using E-Mail and other computer applications), any sense of individual contribution is lost. Employees subjected to such working conditions experience much higher rates of psychological and physical stress (Gardell 1979, in Lueder) and resist the systems which are causing the stress. In addition, when using the computer for tasks that involve very abstract or symbolic information, the employee may lose any sense of the logic behind these activities (Sauter, Harding, Gottlieb, and Quackenboss 1981, in Lueder).

With the implementation of end user computer systems, organizations frequently anticipate great increases in productivity in order to justify the added expense of the equipment, particularly for clerical employees. Therefore, the work load for the operators is frequently based on the characteristics of the

information system, rather than the capabilities of the user. This may mean that workers are forced to work at very high levels at times, while at others, slow downs resulting from equipment down time, or delayed response during heavy use of shared systems, may make them unable to meet production standards or "catch up". Both extremes can be stressful (Sauter, Harding, Gottlieb, and Quackenboss 1981, in Lueder).

Lueder found that work groups that are predominantly clerical are usually support groups. These groups are usually lower status than purely professional groups. In predominantly clerical work groups where the systems are shared and the implementations are top down, one finds the most regimented uses of computing and also the most regimented work lives of group members. In those clerical work groups (with shared systems and top-down implementations) regimentation can mean fine grained monitoring, management concern that the equipment is being used continually, and workers feeling that they are "tied to the machine." Supervisors often maintain strict control over work hours and breaks.

Lueder found the most flexibility in the use of desk top computing in predominantly professional work groups. The flexibility in computer use is also associated with greater flexibility in work, generally. Higher status workers are rarely more tightly

monitored, particularly if they have computerized on their own. These work groups have control over much of the desk top computing implementations in their work lives.

Many authors in the information systems area (Churchill, et. al. 1969, Guthrie 1972, Jackson 1970, Lee 1968, Shaul 1964 and Whisler 1970, as described by Lueder) suggest that the user's view of computer impacts are influenced by their personal backgrounds, organizational level, functional area supervised, and nature (i.e., line or staff) of position. A common trend in these authors' conclusions is that users at lower levels in organizations, in functional areas more dependent on computer systems, and in staff positions are likely to perceive more extensive computer impacts on their work role, their subordinates, and the organization.

Resistance to Change

According to Bouldin (1989), during the implementation and use of computer systems there will be change and people naturally resist change. The overwhelming majority of us tend to be comfortable with the way things are and tend to resist change. No matter how modest the change is that is being implemented, no matter how desperately needed the change is, people will have a tendency to view the

change as disruptive.

One of the most important and fundamental ways to promote the acceptance of E-Mail, then, is to make the users feel comfortable about the change. In order to be able to create a positive end user environment which is ready and willing to accept change, one needs to understand what it is that is resisted. Bouldin states that fear (as noted several times, and introduced by Galitz, is one of the major causes of resistance and, in that regard, potential end users are afraid of loosing whatever it is that they value about their current work -- the possibility of promotion, no longer working with their peers or, simply, the work itself (Bouldin 1989)

Palme (139-156) states that when software systems have been developed and are ready to use, the computer will act as a tool for enforcing the rules built into that software. The computer is much more powerful in enforcing exact adherence to its rules than ordinary written rules. The effects of this enforcement will be that in an organization that uses E-Mail will often have difficulties in adjusting its behavior to the changing environment. The people working with E-Mail will find themselves restricted and hindered by the way in which the computer adheres to its software programs. This rigidity will make people feel frustrated and dissatisfied with their work and make them perform less

efficiently and they will resist the new system accordingly. Such behavior is attributed to the fact that the ability of an individual to influence one's working conditions is very important to the individual's comfort and need to demonstrate good performance. Such a loss of flexibility will be seen as inhibiting good performance and work quality.

An interesting point offered by Palme is that because a computer is such a powerful tool for enforcing rules, people with a yearning for power often use a computer to force their will upon others. Employers are perceived to be aware of the importance of computers to hinder or aid them in achieving their goals. But even when there is no conscious intention to use the computer as a tool for enforcing rules, the effect will often be the same as if the intention were real and, as one would expect, such enforcement of power on an individual gives rise to resistance (Palme 139-156).

Resistance to end user systems such as E-Mail is, as has been shown, a widespread problem. To better predict, explain and increase user acceptance, it is important to understand why people accept or reject computers or computer systems. Davis, Bagozzi and Warshaw (982-1003, hereafter known as "Davis et. al.") state that end user computing often requires the individuals to interact directly with hardware and

software. However, end users are often unwilling to use available computer systems that, if used, would generate significant performance gains (Alavi and Henderson 1981, Nickerson 1981, Swanson 1988 in Davis et. al.) because of the possibility of loss of human value. As technology improves it becomes more important to create applications which people are willing to use. Swanson stated (in Davis et. al.) that understanding why people accept or reject computers has proven to be one of the most challenging issues in information systems research. In Davis, et. al.'s work, the ability to predict and explain user acceptance and rejection of computer based technology was examined. They were particularly interested in how well they could predict and explain future user behavior from simple measures taken after a very brief period of interaction with a system. Davis et. al. built a Theory of Reasoned Action Model (TRA) which was designed to test various factors associated with influences on behavior as it relates to the acceptance of computer technology. They also built a Technology Acceptance Model (TAM) with the goal of being able to provide an explanation of the determinants of computer acceptance that is capable of explaining behavior across a broad range of end user computing technologies and populations. A key purpose of the TAM is to provide a basis for tracing the impact of external

factors on internal beliefs, attitudes and intentions.
The TAM was formulated in an attempt to achieve these
goals by identifying a small number of fundamental
variables suggested by previous research dealing with
the determinants of computer acceptance and TRA was
used as a theoretical backdrop for modeling the
theoretical relationships among the variables.

The TAM posits that two particular beliefs:
perceived usefulness and perceived ease of use are of
primary relevance for computer acceptance behaviors.
The researchers address these questions: how well do
intentions predict usefulness, how well do TRA and TAM
explain intentions to use a system, do attitudes
mediate the effect of beliefs on intentions, and is
there some alternative theoretical formulation that
better accounts for observed data?

The results of the study yielded three main
insights concerning the determinants of computer use:

1. Computer use can be predicted reasonably well
from the intentions of the end users,
2. Perceived usefulness is a major determinant of
intentions to use computers,
3. Perceived ease of use is a significant
secondary determinant of the intentions to use
computers.

Both TRA and TAM postulated that behavioral
intention is the major determinant of usage; that
behavior should be predictable from measures of
intentions. These hypotheses were all supported by the
data (Davis, Bagozzi, and Warshaw 982-1003).

Unfortunately the researchers used MBA students for the survey and therefore the sample is not completely representative of the entire population of managers and professionals whose computer usage behavior should be modeled. Their sample is younger and, as a group, is probably more computer literate than the population which was the target of the model.

As has been reported earlier, in order for E-Mail technology to be successfully implemented within a firm, the culture must be one that supports the sharing of information across traditional organizational boundaries. The implications for effective use of E-Mail is that the technology can limit personal interactions. For example, travel expenses may be reduced through the use of teleconferencing but at the cost of failure to allow for face to face problem resolution. That is, if telconferencing is used in a setting where the participants need to meet face to face to address existing problems, then the result may be dissatisfied users as well as an unresolved problem. E-Mail may be appropriate for use only in certain settings, i.e., those where problems need solving, but the need to meet face to face is low. Therefore, implementation of the technology may bring resistance because of the depersonalizing of interactions between individuals (Kidd and Jones 277-282).

Kidd and Jones found that uncertainty and

resistance is introduced by the implementation process when there is poor or inadequate preparation of the users and that difficulties occur when the support of management is not clear. These principals can be applied to E-Mail. To realize a positive return on the investment in E-Mail, the organization's culture (the collective and shared values which direct individual behavior), as we have seen, must be supportive of information sharing. The culture represents that collection of perspectives, values, assumptions, and expectations that allows individuals to work towards the achievement of a predetermined strategy for the firm. In successful organizations, the culture is usually quite strong in determining how situations are resolved, how communications patterns are set up, and how work gets done. Kidd and Jones state that the culture sets the stage, that is, when a firm's culture dictates strong internal competition for resources and rewards for short term individual results, sharing of significant business information does not occur. In these firms, the return on E-Mail investment is likely to be disappointing. On the other hand, if the firm's culture emphasizes cooperation and teamwork, information sharing will occur and implementation of E-Mail is likely to add significant bottom line value.

The importance of culture as a determinant of the success or failure of such information technology

investments cannot be underestimated. Kidd and Jones
site the case where implementation of an E-Mail system
in a collaborative organization with a strong
information sharing culture produced significant bottom
line improvement. However, in another case,
implementation of an E-Mail system in an organization
without a strong information sharing culture failed
because it simply provided a new mechanism for "passing
the buck." In a third case the implementation of an
uncertainty-reducing system in an organization with a
strong information sharing cultural value of
collaboration and tradition of face to face
communication failed because it was viewed as a threat
to established communication patterns (Kidd and Jones
277-282).

The important message to be gained from Kidd and
Jones work is that if the culture and reward system do
not support teamwork, they must be changed and the
commitment to change must be evident at all levels of
management.

E-Mail systems provide message capabilities which
enable the individual to send information to other
people connected to the system. This capability, along
with other office system use, according to Kalow and
Rosa takes time to master. They have determined
several principles which are basic in the training and
the development of the people who will be using such

office systems. Kalow and Rosa (1984) found that the key to success is in the investment in human resources, that important changes in perception are involved in the introduction and extended use of office systems, that the full advantage of the power and responsiveness of the office systems will depend upon greater sharing of goals, priorities, and functions, that the office system can be designed to provide guidance and support for the user, and that the system can collect data about its use and comments from the users to identify opportunities to expand the support it provides.

The factors determining the end user's perception of the nature and opportunities of office automation are in the introduction of new systems which will affect the pattern and the flow of work in the office. The impact of these systems will be affected by the rate with which the changes take place and the latitude the individual has in responding and adapting to the changes. Each human factor consideration becomes an important element in the planning and implementation of the training and development program that will support the installation of E-Mail systems. People may feel that they are under pressure to do the "thoughtful" work, the analyzing, the creation of information and the decision making; all of which are at the heart of the office system.

Individuals in the office of the future, according

to Kalow and Rosa, may perceive that they are operating under a great deal of pressure, not because the work is changed, but because the interfaces and transitions between work assignments are no longer filled with "fluff". For example, as to the proofreading of a document -- in advanced office systems, (those which can check spelling and store sample phrases), the amount of work and effort of proofreading will be considerably reduced.

Summary And Statement Of Hypothesis

The literature has demonstrated that it is necessary to resolve two important issues. The first is that there is a large amount of research that has concluded that successful implementation of office systems (E-Mail) is dependent upon the support of top management while other research has demonstrated that it is top management who is a major resistor of such systems. Also, as to the use of office systems in the secretary ranks, it has been shown that on one hand there is opportunity for job advancement and associated up-grading of traditional secretarial tasks, while, on the other hand there is significant evidence to indicate that the low level employee is also a resistor of such systems.

This research will quantify and explain these phenomena. It is hypothesized that the data will show

that high level executives and low level secretaries and clerks both resist the use of computers (E-Mail) and it will show that middle level managers do not resist such systems.

Chapter III

RESEARCH METHODOLOGY

In order to clarify and quantify the issues and variables presented earlier, a questionnaire was prepared after modifying the work presented in Vessey and Tait and in Clowes.

The survey which Clowes used in his work was taken from similar instruments which were applied in past studies in the field of information systems research and which have undergone regular scrutiny. Clowes modified previous surveys and adapted them for his use and focused on various organizational, situational, and information system variables related to managers' computer impact and work activity perceptions. Clowes' work attempts to convey the notion that managers' attitudes and behavior are influenced by significant factors in their work environments (such as the organizational, situational, and information system variables referred to earlier). For purposes of this study, Clowes work was modified to reflect the issues presented in this discussion pertaining to E-Mail.

Vessey and Tait used a survey in their study also. Their research also cites others who have applied similar instruments. Vessey and Tait surveyed users of computer systems to measure the success of the systems,

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the degree of user involvement in system design, the impact of the system in the organization and the attitudes of the users.

Instrument

The questionnaire which was used to study the resistances which are related to E-Mail is the product of combining Clowes' and Vessey and Tait's work and adding to and modifying the content. The result is an instrument (Appendix B) which focuses on user attitudes relating to the use of E-Mail.

The first part of the questionnaire (pages 1 and 2) was designed to gather general information relating to the subject's job. The first part of the first section deals with determining how each subject allocates their respective job content as it relates to various types of activities and interfaces with the public. This section provides information as to how and how much computers are used in the office environment.

The second part of the questionnaire (pages 3 through 6) provides information regarding attitudes and opinions regarding E-Mail systems in the organization. The results from this section will be correlated to the information provided in the demographics of the sample. If there were prominent resistances demonstrated, the

answers to the questions in this section would, theoretically, correlate to such factors.

The third section (pages 7 through 9) provides the demographic information. It is from this series of questions that further correlations can be drawn.

Subjects

Fifty questionnaires were distributed. Table 2 describes the response breakdown.

Table 2

Responses

(Frequency Responses)

Management Group:	Responses
1. Secretarial/Clerical	6
2. Technical Managers	5
3. Middle/Supervisory	12
4. Senior/Top	6
Returned/No Input	6
Not Returned	15
Total Responses	50

The subjects were selected randomly from a list of current users of the Monsanto E-Mail system. The subjects are employed at the Monsanto, St. Louis Headquarters site. Only employees of Monsanto's

Chemical Company Division were sent questionnaires.

Of critical importance to the value of the questionnaire is that more than a token amount of input was received from the Top Management group and from the Secretarial group. This frequency distribution was designed to provide a significant enough measure which would demonstrate the resistance patterns between the groups.

Procedure

The questionnaires were mailed to the subjects through the Monsanto intracompany mail system behind a letter of explanation (Appendix A). E-Mail was not used because of the importance of maintaining anonymity from the subjects and E-Mail messaging provides detailed information as to the identity of the sender. With the cooperation of the Monsanto mail room Supervisor, a temporary mail zone was established for the purpose of collecting the responses.

Data Analysis

All of the questionnaires were hand scored. The statistical analysis was supported by the Lotus 1-2-3 Spreadsheet software with Goldstein's Statistics For Use With 1-2-3 as an add-in. The results were analyzed by comparing the various data derived from the

demographics according to the four management groups which have been described earlier. That is, the four different job classifications are being evaluated for significant resistance factors and associated attitudes and opinions related to the use of E-Mail in the subjects' office environment.

Chapter IV

RESULTS

Seventy percent [70%] of the questionnaires were returned. Of the fifty questionnaires which were distributed, six [12%] were returned incomplete, twenty-nine [58%] were used in the study, and fifteen [30%] were not returned.

Demographics

Table 3 describes the demographics of the respondents.

As to the question regarding the "...highest level of education..." (Education), one of the Group 3 respondents indicated that Vocational/Technical School (Tech/Voc.), and College (Coll.) or Graduate School (G.S.). As a result, the total number of responses to this question (30) is greater than the number of individuals responding to the questionnaire (29) which might suggest certain inconsistencies in data tabulation which would lead to spurious conclusions. However, this reporting error does not impact the results of the study.

Table 3

Demographics

(Frequency Responses)

Years @ Current Position:	1-3	4-7	8-11	12-15	16+
Group 1	1	3	2		
2	1	3	1		
3	7	2	1	2	
4	2	2			2

Years @ Firm:	1-5	6-10	11-15	16-20	21-25	26-30	30+
Group 1			1	2	3		
2		1		1	3		
3	1		2	3 ·	4	1	1
4			1		1	2	2

Education:	H.S.	Coll.	G.S.	Tech/Voc.
Group 1	2	3		1
2	1	2		2
3		5	6	2
4		2	2	2

Word/Minute Typing Skill:	0-15	16-25	26-40	41-55	56+
1					6
2	1	2	1		1
3		5	6		1
4	2		2	2	

Experience w/ Computers: Non Word Processing:	0-3	4-6	7-10	10+
1	6			
2	1	2	2	
3	2	5	1	4
4	2	3		1

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(**Table 3, Continued**)

Sex:	**Male**	**Female**
Group 1		6
2	4	1
3	9	3
4	6	

Home Computer:	**No**	**Yes**
Group 1	5	1
2	1	4
3	5	7
4	2	4

Office Computer:	**No**	**Yes**
Group 1		6
2		5
3		12
4		6

Software Used:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Group 1	6	6	2	1	5	6				2
2	4	5	2	5		2	2		1	
3	9	11	6	7	4	8	5	1	2	2
4	5	4	4	1	1	3	2	1	1	

Key to abbreviations and symbols:

```
      Col. = College
      H.S. = High School
      G.S. = Graduate School
 Tech/Voc. = Vocational or Technical School
         1 = Spread Sheet Program
         2 = Word Processing
         3 = Data Base Program
         4 = Utilities Program
         5 = Financial Package
         6 = Communications Package
         7 = Mainframe Based Programs
         8 = Personal Budget Program
         9 = Game
        10 = Other
```

Attitudes and Opinions Regarding E-Mail Systems

The subjects were asked to respond to several statements and questions dealing with certain attitudes they may have about various issues relating to their of E-Mail. Table 4 describes those results.

Table 4

E-Mail Attitudes And Opinions

(Frequency Responses)

Training Sufficiency: Low	1	2	3	4	5	6	7	High
Group # 1	1	1	1	2	1			
2	1	1	1	1	1			
3	2	4	2	1		2	1	
4		2			3	1		

Comprehension Low	1	2	3	4	5	6	7	High
Group # 1	1	1		3		1		
2		1	1	1	1	1		
3	1	1	1	1	2	3	3	
4				1	1	2	2	

Introduction Methods: Don't Like	1	2	3	4	5	6	7	Like
Group # 1	2	1				2	1	
2					1	1	3	
3			2		1	2	7	
4		1		1		1	3	

To Complex to use: Disagree	1	2	3	4	5	6	7	Agree
Group # 1	1	1	1		1	1	1	
2	2			2			1	
3	3	2	1	2	3		1	
4	3	2		1				

(<u>Table</u> <u>4,</u> Continued)

Is <u>E-Mail</u> <u>necessary</u>: No   Yes

		1	2	3	4	5	6	7
<u>Group</u> #	1				1		1		4
	2					1	2	2
	3	1		1			3	7
	4	1	1				1	3

<u>Group</u> #	1	2	3	4	5	6	7
1				1	1		4
2					1	2	2
3	1		1			3	7
4	1	1				1	3

<u>Disrupt</u> <u>daily</u> <u>routine</u>: Not at all   Extremely

<u>Group</u> #	1	2	3	4	5	6	7
1	3			1		2	
2	2	2	1				
3	7	3	2				
4	3		1	2			

<u>For</u> <u>or</u> <u>against</u> <u>E-Mail</u>: Against   For

<u>Group</u> #	1	2	3	4	5	6	7
1				2		1	3
2					1	1	3
3				1	2	1	8
4		2				2	2

<u>Change</u> <u>in</u> <u>performance</u> <u>evaluation</u>: No   Yes

<u>Group</u> #	1	2	3	4	5	6	7
1	2	1		1		1	1
2	2	1	1	1			
3	9	1		1			1
4	4			1			

(One Group 4 Subject did not respond)

<u>Procedural</u> <u>changes</u>: No Change   Change

<u>Group</u> #	1	2	3	4	5	6	7
1	1	1		3		1	
2	1	1	1	1	1		
3	1	2	2		2	2	2
4	3			2	1		

(One Group 4 Subject did not respond)

(Table 4, Continued)

Relationship changes:	Not at All						Extremely
	1	2	3	4	5	6	7
Group # 1	2	1		1	1		
2		1	2		2		
3	2	3		2	1	2	1
4	3			2	1		

(One Group 1 and one Group 3 Subject did not respond)

Impact on Firm:	None						Extreme
	1	2	3	4	5	6	7
Group # 1		1	1	2	1		1
2		1		2	1	1	
3	1		3	3	2	2	1
4				2	3	1	

Clear requirements:	Unclear						Clear
	1	2	3	4	5	6	7
Group # 1	2	3	1				
2	1	1	2			1	
3	4	3	1	2	1		1
4	1	2	2	1			

System easy to use:	Complex						Simple
	1	2	3	4	5	6	7
Group # 1	2		1	2	1		
2			3	1		1	
3	1	2	3		3	1	2
4				3	2	1	

Sufficient resources:	Insufficient						Sufficient
	1	2	3	4	5	6	7
Group # 1	2	1	1			2	
2	1		1	2		1	
3	2	1		2	1	3	3
4		1	1		1	2	

(One Group 4 Subject did not respond)

Success depends on top management use:	Disagree						Agree
	1	2	3	4	5	6	7
Group # 1				1	1	1	3
2		1	2		2		
3		4	.1		2	1	4
4	2	1	2			1	

(Table 4, Continued)

Success depends on middle management:	Disagree							Agree
	1	2	3	4	5	6	7	
Group # 1	1				1	2	2	
2				2	2	1		
3		1		2	2	2	5	
4	2	1			1	1	1	

Success depends on low level management:	Disagree							Agree
	1	2	3	4	5	6	7	
Group # 1	1				1		4	
2				1	1	2	1	
3		1			1	3	7	
4	2	1			1	1	1	

E-Mail is a threat:	Disagree							Agree
	1	2	3	4	5	6	7	
Group # 1	3	2		1				
2	3	1		1				
3	10	1		1				
4	6							

Eliminate E-Mail:	Disagree							Agree
	1	2	3	4	5	6	7	
Group # 1	3			1		1	1	
2	4	1						
3	11		.	1				
4	4	1			1			

Everyone should use:	Disagree							Agree
	1	2	3	4	5	6	7	
Group # 1				1		2	3	
2						4	1	
3		1	1		1	1	8	
4		1		1		2	2	

More productivity:	Disagree							Agree
	1	2	3	4	5	6	7	
Group # 1	1			2	1		2	
2				3	1		1	
3	1	1		2	1	1	6	
4		2				1	3	

Allocation Of Time Spent By Subject

Table 5 describes the responses to the questions related to how the subjects spend their time during the work day. The questions were designed to indicate how much time is spent in verbal discussions and in activities which indicate the use of computers. The date being reported for each group is the average of all of the responses to each respective question. The subjects were instructed to make estimates and to not be concerned if the total of the responses to all of the questions in this section did not total 100%.

Table 5

Allocation Of Subject's Time Spent

(Percentages)

Group #:	1	2	3	4
Meetings, discussions inside the firm	40.8	26.0	33.3	30.0
Meetings, discussions outside the firm	10.8	13.0	13.3	9.2
Review of reports from inside the firm	.8	9.0	6.9	9.3
Review of reports from outside the firm	.8	1.0	.9	2.7
Review of correspondence from inside the firm	27.5	16.0	12.3	11.7
Review of correspondence from outside the firm	24.2	11.0	8.7	4.3

(<u>Table 5</u>, Continued)

Preparation of reports for use inside the firm	21.8	11.0	7.3	3.7
Preparation of reports for use outside the firm	.2	0	0	.8
Preparation of correspondence for use inside the firm	50.0	24.0	8.2	11.7
Preparation of correspondence for use outside the firm	30.0	16.0	3.9	4.2
Filing documents	24.2	17.0	1.3	1.5
Clerical/Secretarial duties	75.0	14.0	.1	3.3

<u>Future Expenses On Technology</u>

Table 6 details the results obtained from the subjects when they were asked their opinions regarding estimates as to their firm's future expenditures on computer technology and related increases in the use of E-Mail. The estimates from each of the four groups have been averaged.

<u>Table 6</u>

Future Expenses On Technology
And Increases In The Use of E-Mail

(Percentage Increases)

<u>Group #:</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Expenditures on Computer Technology	45.8	21.2	22.5	15
Increase in use of E-Mail	68.3	31.2	86.7	30

Sources Of Correspondence

Table 7 describes the subjects responses to the questions dealing with how many items of correspondence they receive on a daily basis from either of four sources. The intent of this question is to determine at what level the subjects are using computers at the time of the study.

Table 7

Sources Of Correspondence

(Percentages)

Group #:	1	2	3	4
Subject's area - no computer generated data involved	42.5	24.6	3.8	8.7
Subject's area - computer generated data involved	20.0	20.6	5.3	8.0
Other area - no computer generated data involved	25.0	17.0	7.5	5.2
Other area - computer generated data involved	19.2	11.2	11.7	7.8

Computer Applications

Table 8 describes the subjects responses to the questions dealing with how the subjects use computers in their work. The intent of this question is to determine, with some specificity, certain frequencies of use relating to common computer applications. The

subjects were asked to place a check mark by each category and in accordance with their ranking of most to least favorite use of computers. A "1" rating was designated as the most favorite use and a "4" rating was designated as the least favorite use.

Table 8

Computer Applications

(Frequency Responses)

Category:	1	2	3	4	5	6	7
Group # 1							
Rating 1			2	6			
2	1					1	
3	1		2			1	
4		1					1

Category:	1	2	3	4	5	6	7
Group # 2							
Rating 1				2		1	2
2	2	1			4		1
3	1			1		1	
4		2	1	1		1	1

Category:	1	2	3	4	5	6	7
Group # 3							
Rating 1	1	1	3	8	1	1	2
2	4	3	2	3	3		1
3	1		2		3	2	3
4	4	3	1		3	4	2

(**Table 8,** Continued)

Category:	1	2	3	4	5	6	7
Group # 4							
Rating 1	3			3			2
2		2	3	2	2	1	1
3	2	2				1	2
4		1	2	1	3	3	

Key to category code:

1 = Making Planning Decisions
2 = Identifying Trends
3 = In the Budgeting Process
4 = In Typing Correspondence
5 = In Office Management
6 = In Managing Personnel Issues
7 = In Modeling Business/Production

Extent Of Involvement With E-Mail

Table 9 reports the results obtained when the subjects were asked to classify their area of operations in terms of the extent of involvement with E-Mail.

Table 9

Extent Of Involvement
With E- Mail

(Frequency Responses)

Group #:	1	2	3	4
Very Extensive	1		2	
Moderately Extensive	4	5	6	4
Not Very Extensive	·1		3	1
Moderately Less Extensive				1
Much Less Extensive			1	

<u>Impact</u> <u>Of</u> <u>E-Mail</u> <u>On</u> <u>The</u> <u>Job</u>

The subjects were provided with a list of statements which were designed to investigate their opinions about how E-Mail impacts their job or work. They were asked to indicate their opinions in the form of a check mark against a grid which provided choices between Strongly Agree (SA), Moderately Agree (MA) and Slightly Agree (SLA), Strongly Disagree (SD), Moderately Disagree (MD) Slightly Disagree (SLD), No Opinion (NO) and Not Relevant (NR). Table 10 provides the results.

<u>Table 10</u>

Impact Of E-Mail On The Job

(Frequency Responses)

<u>Knowledge</u> <u>Is</u> <u>Adequate:</u>

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1	1	3			1		1	
2		3			2			
3	3	4	1	1	2			1
4	1	4			1			

<u>E-Mail</u> <u>Can</u> <u>Improve</u> <u>Work:</u>

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1	4			1		1		
2	2	2	1					
3	5	5	2					
4	3	2					1	

(**Table** **10,** Continued)

Positive Effect On Work:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1	2	2		1	1			
2	1	2	1				1	
3	6	4	2					
4	4						2	

Negative Effect On Work:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1	1		1	3			1	
2				2	1	1	1	
3			1	5	3	4		
4				2	1	1	2	

Improve Decision Making:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1			1	1			2	2
2	1	1	1				1	1
3	3	3	2	1	1	1	1	
4	1	1	2		1		1	

More Effective In Work:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1	2		1			1	2	
2	1		2			1	1	
3	3	6	1			1		1
4	3	1	1		1			

Work Is Complicated:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1		1	1	1	1		2	
2		1	1		2		1	
3	1	4	1	2		1		3
4		3		1	1	1		

(**Table 10,** Continued)

Lower Morale In Area:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1	1	1		1			2	1
2				3	2			
3			1	6	4	1		
4		1			2	1	2	

Headcount Can Decrease:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1				2			2	2
2				3		2		
3		1	1	4	5	1		
4	1	3	1				1	

Subject Resists E-Mail:

	SA	MA	SLA	SD	MD	SLD.	NO	NR
Group 1				2			2	2
2			1	2	1	1		
3			2	10				
4				3	2	1		

Better Plans/Forecasts:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1				1			1	4
2	1		1	1			1	1
3	1	5	1	1	2	2		
4	1	1	1	1	1		1	

The Work Is Less Flexible:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1							1	4
2				3			1	1
3			2	3	1	1		5
4			1	2	1	1	1	

(One Group 1 Subject did not respond)

(**Table** **10,** Continued)

Reduced Clerical Time:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1	1		1		2			2
2		2	1			1	1	
3	4	2	2	2	2			
4	3	2			1			

Better Organization:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1			2	1		1	1	1
2	2	2				1		
3	4	4	2	1		1		
4	2		1	1			2	

More Management:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1		1	1				1	3
2					1		3	1
3	1		4	2	1	2		2
4			1		1	1	3	

Conflict In The Group:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1		1		1			2	1
2				3	1			1
3				7	2	2		1
4				2		1	3	

Opportunity Is Welcomed:

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1	1			1			2	1
2	2	2		1				
3	5	3	2	1		1		
4	3		2				1	

(**Table** **10,** Continued)

You **Are** **A** **Proficient** **User:**

	SA	MA	SLA	SD	MD	SLD	NO	NR
Group 1		1	1	1	1	1		
2	1	1	2		1			
3	4	3	1		2	1		1
4	2	2	1	1				

(One Group 1 Subject did not respond)

Reduction **In** **Amount** **Of** **Paper:**

	SA	MA	SLA	SD	MD	SLD·	NO	NR
Group 1	1	1			1	1	1	
2	3			1	1			
3	7	3	1		1			
4	1	3		1			1	

(One Group 1 Subject did not respond)

Direct Feelings About E-Mail

Part of the section of the questionnaire which gathered demographic information also provided the opportunity for the subjects to express their feelings, in a direct manner, about E-Mail systems. Table 11 summarizes those responses.

Table 11

Direct Feelings About E-Mail

(Frequency Responses)

Subjects Fear E-Mail:	Yes	No	Neutral
Group 1	1	5	
2		5	
3		12	
4		6	

(<u>Table</u> <u>11,</u> Continued)

<u>Job</u> <u>Enhancement</u> <u>Opportunities:</u>	<u>Yes</u>	<u>No</u>	
Group 1	4	2	
2	4	1	
3	10	2	
4	5	1	

<u>Resisted</u> <u>E-Mail:</u>	<u>Yes</u>	<u>No</u>	
Group 1	1	4	1
2		5	
3	1	10	1
4	2	3	1

Chapter V

DISCUSSION

Chapter IV demonstrates quite a bit of surprising data. As will be seen, the hypothesis that there are higher levels of resistance to E-Mail among Senior Managers and Secretaries than in other management groups was refuted. A careful review of the data will illustrate the reasons for refutation.

As to the Demographics presented in Table 3 the data shows that of the group of respondents who have spent a relatively short amount of time in their current positions, their years of employment is somewhat evenly distributed and, as to level of education, the distribution demonstrates that the amount of education increases as the level of management increases and vice versa. As to typing skills, the data indicates that, as expected, the faster typists are clustered in the Secretarial group. Otherwise, the distribution is random.

The question regarding "Non Word Processing Experience" has provided data which shows that, for the most part, the subjects cluster around being new to the use of computers. The distribution of subjects among the sexes is also expected. The Secretarial group is all female while the distribution among the other three

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groups indicates that as the level of management increases, the number of males increase. As to the use of computers in the home and office, the subjects indicated that as the management level increased, the number of computers in the home increased. All of the subjects have computers in their offices and the use of various software programs cluster towards spread sheets, word processing programs, and data base programs. It is important to note that the subjects indicated a high use of Communication packages in their work and, as a result, it is not surprising to see little resistance to E-Mail.

As to certain attitudes and opinions regarding the use of E-Mail, Table 4 shows the responses to certain questions related to the subject's feelings about the use of the E-Mail system. The subjects tend to regard training sufficiency as being "Low", comprehension is evenly distributed between "High" and "Low", the introduction methods were regarded as "Like", and the subjects tended to "Disagree" that the E-Mail system is too complex to use. When asked if they thought that E-Mail was necessary they tended to respond with a "Yes" instead of "No", there was little indication that E-Mail disrupts the daily routine, nearly all are "For" instead of "Against" it, and many responded with a "No" when they were asked if they thought E-Mail would cause

a change in performance evaluations. As to procedural and relationship changes, the subjects lean toward "No Change" and "Not At All", respectively. They belive that the impact of E-Mail on the firm is closer to "Extreme" than "None", that the requirements to use the system are more "Unclear" than "Clear", and that the system is more "Simple" than "Complex" to use. The subjects are evenly split as to their opinions regarding "Sufficient" or "Insufficient" resources, they tend to "Agree" that success depends on top, middle and low level management support, they "Disagree" that E-Mail is a threat to their jobs, and they "Disagree" with its elimination. And finally, when asked if everyone should use E-Mail and if E-Mail would provided more productivity, the responses indicated that the subjects "Agree" in widespread use and tend to "Agree" that there is more opportunity for productivity.

A review of the data in Chapter IV will show that, as to the hypothesis that the high level executives and low level secretaries and clerks both resist the use of computers (E-Mail) and middle level managers do not resist such systems, one can not conclude that the groups can be differentiated according to their responses and that the hypothesis is, therefore, rejected.

When the subjects were asked to provide estimates as to the amount of time they spend at certain tasks during the day, Table 5 was produced. It is interesting to note that, as expected, the employees in the Secretary group spend a substantial amount of time in the "Preparation of correspondence for use inside the firm" and, of course, in doing "Clerical/Secretarial duties". There are no significant correlations which were drawn from the analysis of the data in Table 5.

As to Table 6, the perceptions as to future expenditures on technology and increases in the use of E-Mail, the Secretaries believe that more money will be spent on computers than either of the other three groups and the middle management group believes that the use of E-Mail will increase substantially more than the other groups.

Table 7 provides data as to the source of correspondence for each of the four groups. As to the Secretary and Technical group, the amount of computer generated correspondence is less than correspondence generated otherwise. The Middle and Top Management indicated that they receive more correspondence which is computer generated than they receive otherwise. These results, while interesting, added little to the effort to find evidence of resistance factors to E-Mail

which could be differentiated between each group.

Likewise, the results which are provided in <u>Table 8</u> add little to the effort to find significant relationships between groups which are related to their respective resistances to E-Mail.

<u>Table 9</u> shows that, of the subjects who responded to the questions, there is "Moderately Extensive" use of E-Mail across the entire sample population.

As to the impact of E-Mail on the subject's job, the data presented in <u>Table 10</u> support the conclusion that E-Mail is not resisted in a significant manner by either of the four management groups. It is interesting to note that in each case where a certain attribute is identified as being positive or otherwise supportive of the use of E-Mail, the responses cluster around the "Strongly" or "Moderately Agree" responses and where there is a certain attribute identified as being negative or otherwise not supportive of the use of E-Mail, the responses cluster around the "Strongly" or "Moderately Disagree" responses.

Of particular interest is the responses to the "Subject Resists E-Mail" question. There was one Technical Manager and two Middle Managers who responded with "SLA", two Secretaries who responded with "NO" and "NR". All of the other responses were either "SD", "MD", or "SLD".

And finally, when the subjects were asked to provide their responses to the question regarding whether or not they feared E-Mail, there was only one "Yes" response (in the Secretary group). When the subjects were asked whether or not they thought E-Mail provided job enhancement opportunities, there were far more "Yes" responses than "No" responses, and when the subjects were asked if they resisted E-Mail (again), the clear message, nearly across the board, from the group was that they did not.

Summary

Based on personal observation, the generalization that certain management groups could be differentiated as to their respective attitudes regarding the use of E-Mail was made. It was assumed that the higher one went in an organization the less use/more resistance one would find and, also, one would find significant resistance in the lower levels of the organization. In order to confirm the generalization, subjects were surveyed as to their attitudes and opinions regarding E-Mail and were also asked to provide certain demographic information.

The results were far beyond expectations. The data provided clear indication that such differentiated resistance factors did not exist in the population

which was sampled. The results were so clear that a statistical analysis of the data was not needed.

Limitations

The subjects were all employed by the same firm. In order to test the hypothesis more carefully, the research should have been conducted over a broader population. Adding to the bias is the fact that Monsanto Company is a highly technical company which, as part of it's culture, uses computers quite rigorously. It is likely that the sample may be somewhat influenced in this regard.

Also, the length of the questionnaire was too long and, therefore, scoring was difficult. The questionnaire asked for information which was not totally necessary to the research. In retrospect, the instrument could have been made shorter.

As noted earlier, a statistical analysis was not used. Had the results been less clear, certain analytical treatments would have been employed so that clear distinctions and the respective significances between those distinctions could have been identified.

In a few cases the subjects either provided more than one response to a specific question or they did not respond at all. Although the impact was not significant, the lack of consistency added to

the difficulty in presenting a clear analysis.

Finally, although the questionnaire asked the subjects to provide their age, too few did so. Thus, no conclusions could be drawn from that data.

Suggestions For Future Research

In as much as the results of this work is as clear as it is, it is felt that further research is needed. It would be interesting to conduct the investigation among subjects that 1) are not as technically oriented as the employees of the Monsanto Company, 2) make up a larger sample size (the rejection of the hypothesis may be suspect since the sample size is so small), and 3) are introduced to the questionnaire by a more explicitly worded instruction/cover letter. As to the difficulties associated with the tabulation of data noted earlier, if another study is to be undertaken, more care should be taken in preparing the questionnaire so as to eliminate the potential for inconsistent data collection and tabulation.

If further research is to be conducted, it would be appropriate for the instrument to indicate that the reason the subjects are being asked to participate is for an academic study. Such information might provide a greater impetus for the subjects to respond more carefully.

Appendix A

COVER LETTER

Dear Sir or Madam:

Thank you in advance for taking the time to complete this questionnaire. Hopefully you will not find this imposition too onerous. This questionnaire has been designed to facilitate rapid completion and you need only place a check mark or circle to answer the questions.

Feel free to be very candid in answering these questions as all responses will be <u>strictly confidential.</u> The study which this questionnaire is being applied to is concerned with overall trends rather than revealing the feelings of any one individual. Your responses will be completely anonymous and will be merged with those of others and only the overall statistics will be used in the study. Since your identity will be anonymous, it will be impossible to provide you with feedback.

Also, you are welcome to make notes or comments anywhere on the questionnaire form. Your candid opinions are very important to the validity of the study and, therefore, you should not be hesitant to offer your comments. You have <u>absolute</u> <u>assurance</u> that your completed questionnaire will be kept strictly confidential.

Please work quickly and answer all questions, even if you may be in doubt about the exact meaning of some of the questions; it is difficult to choose wording for a questionnaire that is being used by many different groups of people in several firms. Please check only one response for each question unless otherwise specified. There are no trick questions and this is certainly not a test of your knowledge. Only your <u>honest</u> <u>and</u> <u>frank</u> responses are important.

Thank you for your help.

Appendix B

QUESTIONNAIRE

Please estimate the approximate amount of time you spend on each of the following activities. Please use percentages and round your estimates to the nearest 5 %. Do not be concerned if your answers do not total 100%.

Meetings, informal discussions and telephone
calls with personnel <u>inside</u> your firm   _____

Meetings, informal discussions and telephone
calls with personnel <u>outside</u> your firm   _____

Review and analysis of operating and financial
reports from <u>inside</u> your firm   _____

Review and analysis of operating and financial
reports from <u>outside</u> your firm   _____

Review and analysis of correspondence from
<u>inside</u> your firm   _____

Review and analysis of correspondence from
<u>outside</u> your firm   _____

Preparation of operating and financial reports
for use <u>inside</u> your firm   .   _____

Preparation of operating and financial reports   _____
for use <u>outside</u> your firm

Preparation of correspondence for use <u>inside</u>
your firm   _____

Preparation of correspondence for use <u>outside</u>   _____
your firm

Filing of documents which originated inside <u>and</u>   _____
outside your firm

Clerical/secretarial duties (other than filing)   _____
related to work generated from inside <u>and</u> outside
your firm

Please estimate the percentage changes in your firm
that you expect to see in the following areas over the
next 3 years. Use + and - symbols to indicate
increases and decreases. Round off to the nearest 5 %:

Expenditures on Computers/Computer Technology   ____
Increase in the use of Electronic Mail   ____

Approximately how many items of correspondence (all
kinds) do you receive on a daily basis from each of the
following sources:

Your work area-no computer generated data involved   ____
Your work area-computer generated data involved   ____
Other work area-no computer generated data involved   ____
Other work area-computer generated data involved   ____

Which of the following best describes how you use
computers in your work? Please select four statements
and rank them with a check mark using the 1 to 4 scale.
Use 1 for the most and 4 for the least favorite use.
Leave blank the statements you do not select.

	1	2	3	4
Making planning decisions	__	__	__	__
Identifing trends	__	__	__	__
In the budgeting process	__	__	__	__
In typing correspondence	__	__	__	__
In office management	__	__	__	__
In managing personnel issues	__	__	__	__
In modeling business/production	__	__	__	__

How would you classify your area of operations in terms
of the extent of involvement with Electronic Mail?

Very extensive   ____
Moderately extensive   ____
Not very extensive   ____
Moderately less extensive   ____
Much less extensive   ____

The following statements refer to the attitudes you may have regarding Electronic Mail systems. For each statement please circle the appropriate number on the scale which describes the attitude or relationship described in the statement:

The amount of training that is given to you regarding the use of Electronic Mail systems is:

```
                  1   2   3   4   5   6   7
     Insufficient/Low                      Sufficient/High
```

The degree of comprehension that you have about Electronic Mail systems is:

```
                  1   2   3   4   5   6   7
     Insufficient                          Sufficient
```

How do you feel about the introduction of Electronic Mail in your firm?

```
                  1   2   3   4   5   6   7
     Don't like                                    Like
```

The Electronic Mail system is to complex to understand and use.

```
                  1   2   3   4   5   6   7
     Disagree                                      Agree
```

Do you think Electronic Mail is necessary?

```
                  1   2   3   4   5   6   7
     No                                            Yes
```

Does Electronic Mail disrupt your daily routine.

```
                  1   2   3   4   5   6   7
     Not at all                               Extremely
```

Were/are you for or against the introduction of Electronic Mail?

	1	2	3	4	5	6	7	
Against								For

Were/are there any changes in the criteria by which your skills and performance was/is evaluated after the introduction of Electronic Mail?

	1	2	3	4	5	6	7	
No								Yes

Did you have to change your work procedures to meet the requirements of the Electronic Mail system?

	1	2	3	4	5	6	7	
No change								Change

The use of Electronic Mail has required a change in the relationships between you and your peers.

	1	2	3	4	5	6	7	
Not at all								Extremely

How large was the overall impact of the Electronic Mail system in your firm?

	1	2	3	4	5	6	7	
None								Extreme

Initially, were the system requirements clearly defined for you?

	1	2	3	4	5	6	7	
Unclear								Clear

Are the required operations of the system easy to use?

          1   2   3   4   5   6   7

Complex   Simple

Are there sufficient resources available for Electronic Mail training and assistance?

          1   2   3   4   5   6   7

Insufficient   Sufficient

The successful implementation of Electronic Mail is dependent upon it's use by high level management.

          1   2   3   4   5   6   7

Disagree   Agree

The successful implementation of Electronic Mail is dependent upon it's use by middle level management.

          1   2   3   4   5   6   7

Disagree   Agree

The successful implementation of Electronic Mail is dependent upon it's use by low level management.

          1   2   3   4   5   6   7

Disagree   Agree

Electronic Mail is seen as a threat to your job.

          1   2   3   4   5   6   7

Disagree   Agree

Electronic Mail should be eliminated.

          1   2   3   4   5   6   7

Disagree   Agree

Electronic Mail should be used by everyone in your firm whenever possible.

	1	2	3	4	5	6	7	
Disagree								Agree

I am able to be more productive in my work when I use Electronic Mail.

	1	2	3	4	5	6	7	
Disagree								Agree

The next series of statements are designed to investigate <u>opinions</u> <u>about</u> <u>how</u> <u>Electronic</u> <u>Mail</u> <u>impacts</u> <u>your</u> <u>job</u> <u>or</u> <u>work.</u> Please check the point on the scale that most closely expresses your feelings about each item as it relates to you personally. Please use the "N.R." only when you feel that the item is inapplicable to you. Use "N. O." when you feel that the item is applicable to you, but you are not sure whether you agree or disagree with the statement. Where you have a definite opinion, indicate whether your agreement or disagreement is felt strongly, moderately, or slightly.

S=Strongly, M=Moderately, SL=Slightly
N.O.=No Opinion, N.R.=Not Relevant

<u>Agree</u>			<u>Disagree</u>					<u>Statements</u> <u>related</u> <u>to</u>
S	M	SL	S	M	SL	N.O.	N.R.	<u>your</u> <u>job</u> & <u>your</u> <u>work</u>
—	—	—	—	—	—	—	—	Knowledge is adequate
—	—	—	—	—	—	—	—	E-Mail can improve work
—	—	—	—	—	—	—	—	Positive effect on work
—	—	—	—	—	—	—	—	Negative effect on work
—	—	—	—	—	—	—	—	Improve decision making
—	—	—	—	—	—	—	—	More effective in work
—	—	—	—	—	—	—	—	Work is complicated
—	—	—	—	—	—	—	—	Lower moral in area
—	—	—	—	—	—	—	—	Headcount can decrease
—	—	—	—	—	—	—	—	You resist E-Mail
—	—	—	—	—	—	—	—	Better plans/forecasts
—	—	—	—	—	—	—	—	Work less flexibility
—	—	—	—	—	—	—	—	Reduced clerical time
—	—	—	—	—	—	—	—	Better organization
—	—	—	—	—	—	—	—	More management
—	—	—	—	—	—	—	—	Conflict in your group
—	—	—	—	—	—	—	—	Opportunity is welcomed
—	—	—	—	—	—	—	—	You are proficient user
—	—	—	—	—	—	—	—	Reduction in paper
—	—	—	—	—	—	—	—	

You are:

Male _____   Female _____

Your age is: _____

Do you have a computer at your home?

Yes _____   No _____

Do you have a computer at your work station/office?

Yes _____   No _____

Please check all of the software programs you use:

Spreadsheet   _____
Data Base   _____
Word Processing   _____
Utility Programs   _____
Financial Package   _____
Communications   _____
Mainframe Based   _____
Games   _____
Personal Budget   _____
Other   _____

Do you feel that using Electronic Mail systems enhances your job?

Yes _____   No _____

When E-Mail was introduced in your area, you:

Resisted it _____   Welcomed it _____

Where you employed with you firm when it first became involved with Electronic Mail?

Yes _____   No _____

If Yes, were you in your present position when the firm first became involved with Electronic Mail?

Yes _____   No _____

Were you or are you now fearful of the use of Electronic Mail?

Yes _____   No _____

How many years have you been using a computer (do not count other automated systems such word processing networks? Check one:

0-3 _____
4-6 _____
7-10 _____
10 + _____

How many words per minute do you type?   (Please use your best estimate)?

0-15 _____
16-30 _____
26-40 _____
41-55 _____
56 + _____

Which of the following best describes your area of work in your firm? Check one:

Technology/Engineering _____
Sales/Marketing _____
Production _____
Law _____
Accounting/Finance _____
Administration _____
Personnel _____
MIS _____
Other _____   Your area: _____

Which of the following best describes your level of
management responsibility? Check one:

     Senior/Top (Director level or above)   ____
     Middle/Supervisory   ____
     Technical   ____
     Clerical/Secretarial   ____

Please indicate the number of years (round up to the
nearest whole number) you have been in your current
position:

     1 - 3   ____
     4 - 7   ____
     8 - 11   ____
     12- 15   ____
     16 +   ____

Please indicate the number of years (round up to the
nearest whole number) you have been working for your
firm:

     1 - 5   ____
     6 - 10   ____
     11- 15   ____
     16- 20   ____
     21- 25   ____
     26- 30   ____
     30 +   ____

Please indicate only the highest level of education you
have had:

	Completed	Did Not Complete
Elementary School	____	____
High School	____	____
College	____	____
Graduate School	____	____
Trade/Vocational School (includes secretarial school)	____	____

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