ABSTRACT

ELECTRONIC RESEARCH ADMINISTRATION: IMPLEMENTATION AT NEW JERSEY INSTITUTE OF TECHNOLOGY

by
Lauren V. Rethwisch

Electronic Research Administration has become the current focus and future direction of the professional field of research administration. It is commonly acknowledged that by the end of this century, all administrative grant functions will be performed by means of electronic data interchange. How well positioned is New Jersey Institute of Technology, a mid-size public research university, to implement pre-award Electronic Research Administration? My research evaluates the readiness of the university community to convert its various pre-award manual processes to an on-line system. The proposed evaluation takes place through a series of internal questionnaires and structured interviews with subject matter experts. Further, the research targets implementation strategies. This report, then, describes the proposed project, first delineating the research background then outlining the necessary steps toward implementation by examining Cognitive Dissonance Theory as it relates to persuasive communication techniques. A comprehensive review of the collected data will help NJIT take the initiative to secure its future in the competitive realm of research funding.

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IMPLEMENTATION AT NEW JERSEY INSTITUTE OF TECHNOLOGY

by
Lauren V. Rethwisch

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APPROVAL PAGE

ELECTRONIC RESEARCH ADMINISTRATION:
IMPLEMENTATION AT NEW JERSEY INSTITUTE OF TECHNOLOGY

Lauren V. Rethwisch

Dr. Norbert Elliot, Thesis Advisor   Date
Professor and Chair
Department of Humanities and Social Sciences

Dr. Nancy Coppola, Committee Member   Date
Assistant Professor and Program Director, Professional and Technical Communication
Department of Humanities and Social Sciences

Dr. Burt Kimmelman, Committee Member   Date
Assistant Professor
Department of Humanities and Social Sciences

BIOGRAPHICAL SKETCH

Author: Lauren V. Rethwisch

Degree: Master of Science

Date: January 1998

Undergraduate and Graduate Education:

- Master of Science in Professional and Technical Communication,
  New Jersey Institute of Technology, Newark, NJ 1998

- Bachelor of Arts in Sociology
  Rider University, Lawrenceville, NJ 1983

Major: **Professional and Technical Communication**

To all of those who stood beside me and with me throughout this project.

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INTRODUCTION

1.1   Research Background

Electronic Research Administration (ERA), the development and management of grants

and contracts through electronic means rather than manual systems, is not simply about

technology. It involves a partnership between sponsoring federal agencies and the

universities they fund. Following a decade of seemingly endless research dollars in the

1980s, the 1990s have proved to be much leaner. Pressures in the federal government to

re-engineer, modernize, and downsize federal offices, as well as increased fiscal

constraints at universities (particularly those that relied heavily on state funded operating

budgets), have increased the pressure to investigate and develop alternative ways to do

business. Electronic Research Administration is one alternative.

This report will focus mainly on pre-award aspects of grant management. Generally

the pre-award phase includes researching funding opportunities, proposal development

and submission and, finally, award negotiation for successful proposals. This function of

grant administration has been particularly overwhelmed by seemingly endless reams of

unnecessary paper.   To identify the most plaguing problems associated with manual pre-

award administration, the US Department of Energy funded the "Electronic Research

Administration Feasibility Study." This study was conducted by Federal Information

Exchange, Inc. Robert Killoren, an expert in the field of Electronic Research

Administration from the Pennsylvania State University, reviewed this study.

Killoren identifies eight of the most costly, labor intensive tasks associated with pre-award grant management:

1. the necessity to print proposals which are often created electronically;

2. responding to unique formats for each agency;

3. rekeying of data into official university systems and unofficial shadow systems;

4. rekeying of data into agency systems;

5. inability to link these stand alone systems;

6. the excessive time involved in preparing a proposal and in the agency response time;

7. excessive costs of duplicating and mailing; and

8. a costly peer review process (both at the university and agency level).

According to Killoren, the current pre-award process, even at the most technically advanced universities, is "a paperchase that yields a multiplicity of stand-alone systems containing redundant data that require extensive rework to maintain. The lack of standards, inter-connected systems, and control procedures causes errors and delays and increases costs as proposal numbers grow." Electronic Research Administration seeks to reduce, if not eliminate, the problems associated with pre-award activities.

Two user groups are targeted for Electronic Research Administration. Both have significant, yet different, reasons for wanting to see ERA implemented based on their varied agendas.

Clearly the federal government has a stake in implementation at granting agencies. Several demonstration projects sponsored by a cooperative of six agencies are currently underway across the country. The goal is to completely automate the transmission of all

grant activities from program announcements to final programmatic reports at the end of the grant cycle. Interagency action committees have been formed to address critical issues such as standardization of agency forms and general proposal format.

The other user group, the subject of the present paper, is the university. In-house systems must be developed to support the changes initiated by the federal government. However, before a system can evolve or even be discussed, a determination must be made as to the readiness of the university and more importantly, the willingness of the participants to change.

The movement toward Electronic Research Administration calls for fundamental changes in the way a university traditionally conducts business. As with all change, this will produce anxiety for those who are involved both directly and indirectly. However, as Robert Killoren states, "when the process is completed, hopefully we will look back and see that the change was not only inevitable but necessary and good"(7). He identifies four ingredients for change, which are critical to the successful implementation of ERA:

1. The will to change. This is represented by a desire for quality grants management.

2. The motivation and authority to effect change. This is evidenced by the creation of federal committees to address ERA and the real economic need for both parties to do more with less.

3. The resources necessary to take action. One example is the investment made by several federal agencies and grantee organizations in streamlining efforts.

4. The means for change made possible by newly emerging computer technologies.

With such an investment on the part of the federal agencies ERA will not be an option for very long. By the year 2000, most grant activity will be exclusively automated. While NJIT must comply, how will this compliance be gained at NJIT?

1.2 Present Institutional Commitments

New Jersey Institute of Technology has already taken steps toward the implementation of Electronic Research Administration. The Office of Sponsored Programs, which is responsible for the submission of all University proposals, has developed a homepage on the University website. This homepage has the potential to serve as a valuable resource to the research community. Under the URL

www.njit.edu/Directory/Admin/Sponsored_Programs/Welcome.html, the site outlines University policies and procedures as they relate to proposal development. This site also offers links to all major federal agencies. Researchers are now able to uncover funding opportunities in a more thorough and timely manner than previously possible. No doubt the Sponsored Programs homepage will continue to evolve as agency sites and other resources become available on the internet.

The University is also committed to infrastructure improvements that will support ERA. According to the Executive Director of Computing Services, Mr. Thomas Terry, it is expected that by the Fall 1998 semester, all academic and administrative offices will be equipped with high-speed access to the internet.

Hardware and software are continually upgraded as well. The Computing Services Department is constantly working to meet the maintenance challenges brought forth by such an elaborate network.

The University has also sponsored numerous workshops for faculty and administrators that directly or indirectly discussed ERA. Most recently, representatives from the National Science Foundation were invited to NJIT to present four workshops over a two day period on their interactive database NSF FASTLANE. All of these workshops have met with enthusiasm on the part of NJIT's research community.

Although much work remains before full implementation of ERA can be realized by NJIT, these actions offer a positive outlook.

CHAPTER 2

THEORY SUPPORTING THE RESEARCH

2.1 Cognitive Dissonance Theory

Change, driven by the incorporation of Electronic Research Administration, is inevitable. How do we as humans, adapt and incorporate such change into the workplace?

Re-organizing, downsizing, and re-engineering are terms which have become fashionable in the workplace to infer change. When uttered, they almost always have negative implications for those on the receiving end. Rumors begin to fly, paranoia sets in, and stress levels soar. Is there anyway for change to be implemented whereby those effected will experience a minimum of discomfort and possibly accept or welcome the change? Compliance gaining techniques, based on communication theory, address such questions with an eye toward reducing dissonance for all who will be touched by the change. I offer Cognitive Dissonance Theory as a source to investigate how we process change in our lives (in this case our working lives) and how compliance can be gained.

Dissonance theory, from the field of cognition studies, may assist in our understanding of compliance gaining. Cognitive Dissonance Theory was developed by social psychologist Leon Festinger in the 1950s. He developed the theory while investigating the ways in which citizens of India dealt with a devastating earthquake. Festinger noticed that shortly after the quake, rumors began to circulate that an even worse disaster was about to strike. Although the population was already frightened, the rumors persisted. Festinger writes, "Certainly the belief that horrible disasters were about

to occur is not a very pleasant belief, and we may ask why rumors that were anxiety provoking arose and were so widely accepted. Finally a possible answer to this question occurred to us- an answer that had the promise of a having a rather general application: perhaps these rumors predicting even worse disasters to come were not anxiety provoking at but were rather anxiety justifying"(Festinger, 20). He further explains that as a result of the earthquake people were already frightened. The rumors of more danger to come fueled their fear. They were finally provided with information that matched the way they felt thus justifying their anxiety. From this point Festinger developed the concept of dissonance between cognitive elements and dissonance reduction.

Figure 1 shows the basic outline of Cognitive Dissonance Theory. Festinger believed that any combination of cognitive elements (defined as attitudes, perceptions, beliefs, behaviors or knowledge of a subject) could have one of three relationships. The first is a null or irrelevant relationship whereby there is no connection between elements. The second is a like or consonant relationship. Festinger uses attitudes about smoking as a good example of a consonant relationship. A person may believe that smoking contributes to many health problems and hence does not smoke. In this case the perceptions match the behavior. But what about the person who is aware of the risks involved but still elects to smoke? Festinger cites this as the third type of relationship, which he calls dissonant. In order for a person to smoke, once aware of the dangers involved, she must reduce the dissonance between what she does and what she knows to a level sufficient enough to permit the behavior (91).

Festinger's theory has two main hypotheses: 1) humans strive for consistency. When there is dissonance, we will work to reduce it to achieve consonance. The greater the

dissonance, the greater our need to reduce it; 2) in addition to trying to reduce dissonance, the person will actively avoid situations and information which would likely increase the dissonance (3-7). He further states that,"If two elements are dissonant with one another, the magnitude of the dissonance will be a function of the importance of the

THEORY OF COGNITIVE DISSONANCE

Dissonance theory cites three relationships among cognitive elements:

1. Null or Irrelevant

2. Like or Consonant

3. Conflicting or Dissonant

FORCED COMPLIANCE————→DISSONANCE

INCENTIVES————→DISSONANCE REDUCTION
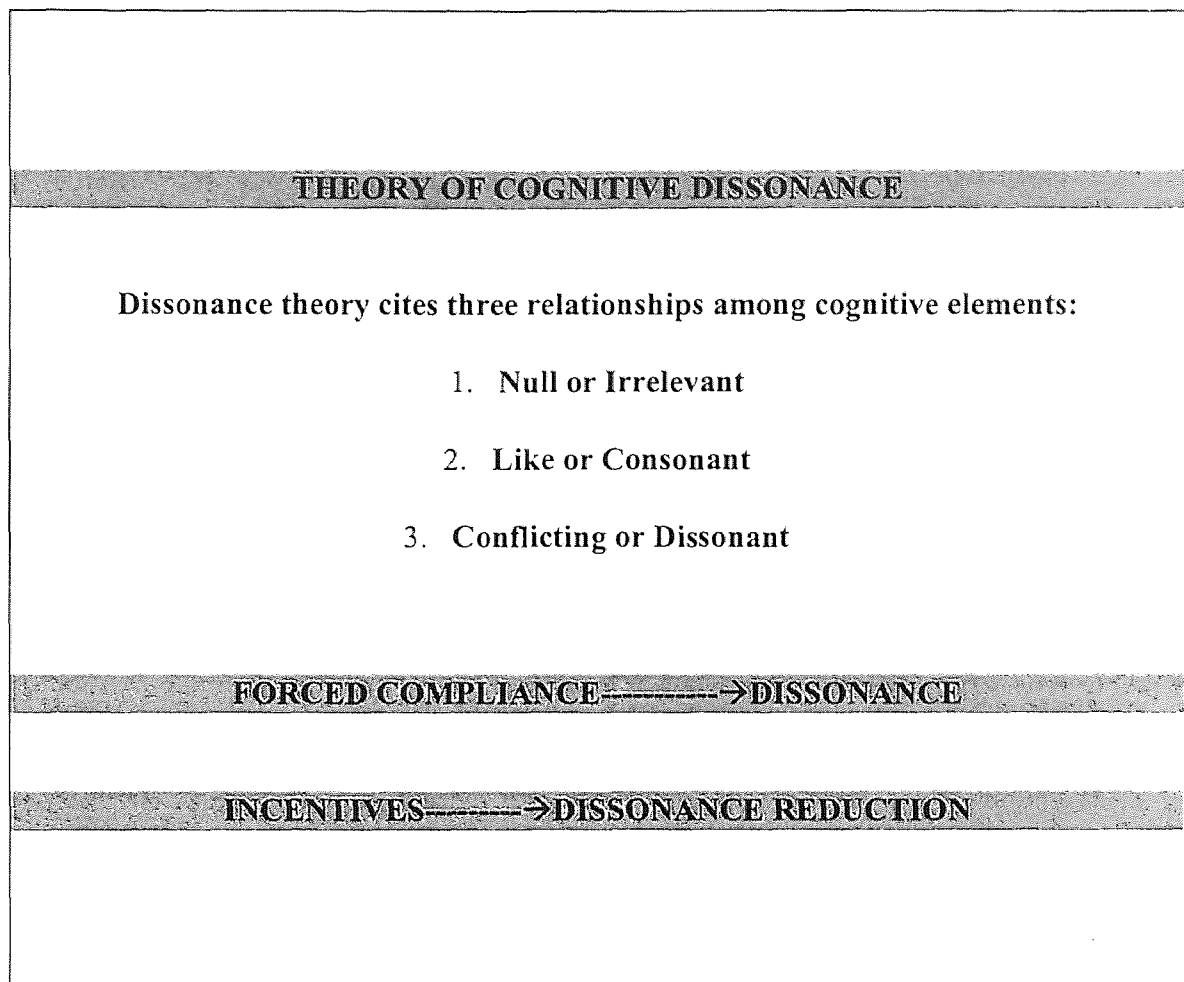
Figure 1. Theory of Cognitive Dissonance

elements" (16). This is of central importance when we discuss dissonance due to change in the workplace. Clearly, most people take their employment situations seriously. We spend approximately one third of our adult lives in the workplace. Therefore, since work

plays such a major role in our lives the potential for dissonance is great, as is the need to reduce it.

This is one reason why the Cognitive Dissonance Theory translates fairly well when explaining change in the workplace. Festinger states that one of the main instances under which a person may be resistant to change occurs when the current behavior is otherwise satisfying. In our case of Electronic Research Administration, the parties involved are comfortable or satisfied with the current practices. Anything else would not be considered consistent. Take, for example, the researcher who has very little computer experience and has always relied on her own manual methods for submitting a proposal perhaps along with the assistance of a grant services office. The prospect of electronically submitting the same proposal could be extremely unsettling. Does she have the expertise? Does she have the necessary equipment? What if something goes wrong? She may ask, "Am I the only one who will have difficulty in doing this?" All of these unknowns contribute to the presence of dissonance. Although these fears will most likely be shared by many others in the case of ERA, Festinger adds fuel to these doubts when he writes, "Identical dissonance in a large number of people may be created when an event occurs which is so compelling as to produce a uniform reaction in everyone. For example, an event may occur which unequivocally invalidates some widely held belief" (262). Although not a global concern, certainly ERA represents a widespread change for the university community. It can be seen as a threat to some and an enormous inconvenience for others.

Yet as we have discussed, change is inevitable.

2.2 Four Views of Compliance

According to Festinger, compliance occurs naturally when a person's private opinion is

changed to match his overt behavior (Festinger,130). The example of a faculty member

always waiting until the last minute to submit a proposal can be applied. If a faculty

researcher, through her own knowledge gaining, determines that late submittal is a poor

way to develop proposals, her private opinion is changed. At this point she may modify

her overt behavior to match her new opinion. Usually, this is the course that compliance

takes. Increased knowledge leads to a change in private beliefs and opinions. Once again,

however, increased knowledge about one cognitive element must be sufficiently relevant to

elicit change in the other cognitive element. Very often, however, private opinion change

does not occur regardless of the amount of information available that would support the

change. If a change is essential, as is the case ERA, compliance must be forced. Festinger

states that public compliance without an accompanying change in private opinion or

belief will occur when the following conditions exist:

1. The compliance is brought about mainly through the exertion of a threat of
   ment for noncompliance, the individual against whom the threat directed
   being sufficiently restrained from leaving the situation.

2. The compliance is brought about mainly through the offer of a special
   reward for complying. Under this circumstance, if the reward is
   sufficiently attractive to overcome the existing resistance, the individual
   may comply overtly in order to obtain the promised reward (85).

Festinger, however, offers a rather narrow explanation of how to actually gain the

desired compliance: threat of punishment or promise of reward. While these are certainly

effective, three other groups of researchers expand the groundwork laid by Festinger.

plays such a major role in our lives the potential for dissonance is great, as is the need to reduce it.

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MARWELL AND SCHMITT'S COMPLIANCE GAINING STRATEGIES

1. *Promising* Promising a reward for compliance

2. *Threatening* Indicating that punishment will be applied for non compliance

3. *Showing expertise about positive outcomes* Showing how good things will happen to those who comply

4. *Showing expertise about negative outcomes* Showing how bad things will happen to those who do not comply

5. *Liking* Displaying friendliness

6. *Pregiving* Giving a reward before asking for compliance

7. *Applying aversive stimulation* Applying punishment until compliance is achieved

8. *Calling in a debt* Saying the person owes something for past favors

9. *Making moral appeals* Describing compliance as the morally right thing to do

10. *Attributing positive feelings* Telling the other person how good she/he will feel if there is compliance

11. *Attributing negative feelings* Telling the other person how bad she/he will feel if there is non-compliance

12. *Positive altercasting* Associating compliance with people with good qualities

13. *Negative altercasting* Associating non-compliance with people with bad qualities

14. *Seeking altruistic compliance* Seeking compliance simply as a favor

15. *Showing positive esteem* Saying that the person will be liked by others more if she/he complies

16. *Showing negative esteem* Saying that the other person will be liked less by others if she/he does not comply

Figure 2. Marwell and Schmitts Compliance Gaining Strategies

Obviously, not all of Marwell and Schmitt's strategies would be effective in every

situation. In the case of ERA and the audience targeted for it, strategy 3, Showing

expertise about positive outcomes, it the approach taken in this research. It is necessary to show "how good things will happen to those who comply."

From this point Marwell and Schmitt conducted a study whereby they asked subjects to apply these same strategies to compliance gaining situations. When the data from this exercise was analyzed, the compliance gaining strategies could be placed in five general categories or as Marwell and Schmitt referred to them, "clusters of tactics." According to the researchers, "These clusters include rewarding (for example, promising), punishing (for instance, threatening), expertise (as in displaying knowledge of rewards), impersonal commitments (examples would include moral appeals), and personal commitments (such as debts (119).

Until the time that Marwell and Schmitt conducted their extensive study, most of the research in this area was designed to look at the reasons why people comply rather than how to actually gain compliance. Since the time of their studies, others have recognized the need for exploration on this topic and have followed suit.

William Hamlin, Richard Wiseman and G.N. Georgacarakos recognized a need to find a theoretical basis for Marwell and Schmitt's taxonomies. They decided that a scheme needed to be developed that would outline compliance gaining strategies that people actually used.

Hamlin, Wiseman and Georgacarakos recognized a need to find a theoretical basis for Marwell and Schmitt's taxonomies. They decided that a scheme needed to be developed that would outline compliance gaining strategies that people actually used.

The researchers identified four elements of compliance gaining in developing their model. The first is, "the degree to which the persuader reveals the compliance-gaining

goals"(120-122). This strategy can be direct, indirect or misleading on the part of the persuader. For example, in the case of the university researcher whose workplace is converting to ERA, the administration of the university could directly ask them to participate in the conversion because it is the wave of the future. Or, the administration could tell them that a competing college is converting and we must follow suit. The deceptive approach might be to say that a third party, such as university auditors or board of trustees, is requiring the transition and so it must be carried out.

The second element the researchers discussed is whether the compliance gaining strategy is based on sanctions (which include rewards and punishments) or on reasons and explanations. To apply this to our workplace situation, a researcher could be told that if she/he does not accept ERA, they will no longer be able to submit research proposals because there will be no one who can assist them with the non-electronic, manual process.

According to the Hamlin group, the third element of compliance gaining is stated or implied rationale for the asking that is required. Unlike simply stating the request, an explanation would now accompany it. For example, in the case of asking a researcher to utilize ERA methods, one could add to the request that the federal government will be looking favorably on universities who convert earlier than actually required.

The fourth element of compliance gaining according to Hamlin, Wiseman and Georgacarakos deals with who actually controls the situation. "In the case of a threat or a promise, for example, the persuader controls the outcome. In the case of a guilt appeal, the control is in the hands of the other person"(120). In Figure 3, I present an outline version of compliance gaining strategies resulting from the four elements outlined above.

I have modified the original version (Littlejohn, 121-122) for brevity since the original was unnecessarily detailed for the purpose of this paper. These, again, are the strategies that subjects surveyed indicated they actually used to gain compliance. In Figure 4, I applied these strategies to the focus of this paper, compliance in the workplace in the case of ERA.

The twelve persuasive messages outlined in Figure 4 each have a very different tone, which I believe impacts their effectiveness in the university situation. For example, Ingratiation, Promise and Allurement appear to have positive tones in that they each indicate a reward. Using these messages, the researcher would actually receive compensation for their trouble. If compliance is gained both the compliance seeker and the researcher would gain in each of these scenarios.

Four more of the messages appear to be middle of the road, which I believe would make them neither effective nor ineffective in a university setting. Esteem, Altruism, Direct Requests and Explanation are vague messages that could possibly elicit compliance in a more intimate situation such as a parent/child relationship. However, in a professional situation, it is necessary to outline a clear direction with a concrete plan of development and execution.

The remaining five persuasive messages outlined in Figure 4 have negative tones and implications. Debt, Aversive Stimulation, Threats, Guilt and Warning would not be effective compliance gaining techniques in the university situation. When dealing with respected and accomplished faculty in a collegial setting, threats are not appropriate. More likely, they would evoke feelings of resentment and defensiveness creating resistance rather than compliance. Calling in a debt also seems to be a negative way to

gain compliance. Previous university support should not be used as a weapon. These negative messages have no place in a university situation and, as such, were not used in this study.

DEFINITIONS OF THE STRATEGIES

I. SANCTION STRATEGIES
   A. Reward Appeals

   1. Rewards are controlled by the persuader
      a. Ingratiation: Persuaders pro-offered good, services or sentiments precede the request for compliance. They can can be verbal or nonverbal. Form: Present reward from persuader implies compliance.
      b. Promise: Persuaders pro-offered goods, services or sentiments are promised to the target in exchange for compliance. This may include a bribe or a trade. Form: Future reward from persuader implies compliance.
      c. Debt: Persuader recalls obligations owed to him or her by the target as a way of inducing the target to comply. In addition to actual debts, this may include "after all I've done for you". Form: Past reward from persuader implies compliance.

   2. Rewards are controlled by the target.
      a. Esteem: Target's compliance will result in automatic increase increase in self-worth. "Just think how good you will feel if you do this" or "everybody loves a winner" exemplify this. Form: Compliance implies future rewards because of the target's action.

   3. Rewards are controlled by circumstance.
      a. Allurement: The target's reward arises from persons or conditions other than the persuader. The target's compliance could result in a circumstance in which other people become satisfied, pleased or happy. These positive attitudes will be beneficial to the target. "You will always have their respect" is an example. Form: Compliance implies future reward because of the action of forces other than the target.

   B. Punishment Appeals
   1. Punishments are controlled by the persuader.
      a. Aversive stimulation: Actor continually punishes target making cessation contingent upon compliance. Examples include pouting, sulking, crying, acting angry. Form: Non-compliance implies present punishment.
      b. Threat: Persuader's proposed actions will have negative negative consequences for the target if she does not comply. An example would be blackmailing. Form: Non-compliance implies future punishment.
   2. Punishments are controlled by the target.
      a. Guilt: Target's failure to comply will result in automatic decrease in self-worth. Form: Non-compliance implies future future punishment because of target's action.

Figure 3. Definitions of Strategies

3. Punishments are controlled by circumstance.

a. Warning: Target's punishment arises from persons or conditions other than the persuader. The target's non-compliance could lead to a circumstance in which other people become embarrassed, offended or hurt. Resulting negative attitudes will have harmful consequences for the target. "You'll make the boss unhappy" is one example. Form: Non-compliance implies future punishment because of the action of forces other than the persuader or target.

II. ALTRUISM STRATEGIES

Altruism: Persuader requests the target to engage in behavior designed to benefit the persuader rather than the target. Asking the target for help is typical. "do me a favor" is one example. Form: Comply for the persuader's sake.

III. ARGUMENT STRATEGIES

A. Response controlled by the Rationale, and Rationale not revealed by the persuader. Direct request: The persuader simply asks the target to comply. The motivation or inducement for complying is not provided by the persuader but must be inferred by the target. "Why don't you think about doing this" or "I want you to do this" are examples. Form: The target might comply.

B. Response controlled by the Rationale, and the Rationale revealed by the persuader.
Explanation: One of several reasons are advanced for believing or doing something. "I know from experience" is an example. Form: The reason complying is based on evidence.

C. Response controlled by Rationale, situational context revealed by persuader. Hinting: Persuader represents the situational context in such a way that the target is lead to conclude the desired action or response. Persuader may say "it sure is hot in here" rather than directly requesting that the target turn down the heat. Form: Given the situational context, the target should infer the desired response.

IV. CIRCUMVENTION STRATEGIES

Deceit: Persuader gains target's compliance by intentionally misrepresenting the characteristics or consequences of the desired response. "It's easy," when in fact the task is very difficult. Form: Given false rationale or reward, compliance is requested.

Figure 3. (Continued)

PERSUASIVE MESSAGES FOR THE ERA SITUATION

1. **Ingratiation:** The university will reward researchers who submit proposals, then ask them to comply with ERA training and methods.

2. **Promise:** The university will provide upgraded equipment for the researchers who comply with the ERA conversion plans.

3. **Debt:** The university could recall past seed support given to the researchers and that the researcher owes the university support as they it tries to further it's research mission.

4. **Esteem:** The university could state that researchers who comply will be highly regarded in the research community.

5. **Allurement:** The university could present statistics showing that due to ease of processing, most researchers eventually submit more proposals.

6. **Aversive Stimulation:** The university would not recognize proposals that were not submitted electronically.

7. **Threat:** The university would state that a proposal will not be submitted unless it is processed electronically.

8. **Guilt:** The university could say that due to reduced staff, it would be very difficult and costly to continue to manually submit proposals.

9. **Warning:** The university could inform researchers that as of a specific date, the federal government will no longer accept manual proposals.

10. **Altruism:** The university might proclaim that for the sake of the university's future research growth, all proposals must be submitted electronically.

11. **Direct Request:** The university would simply ask all researchers to submit proposals electronically.

12. **Explanation:** The university could take the position that due to budget cuts, it is now required that all proposals be submitted electronically.

Figure 4. Persuasive Messages for the ERA Situation

Not all of the persuasive message scenarios lend themselves equally as well to the ERA situation. Yet this exercise shows that a variety of techniques exist to enhance the possibility of gaining compliance.

The fourth group of researchers that I would briefly like to discuss offers another comprehensive analysis of compliance gaining. Lawrence Wheeless, Robert Barraclough and Robert Stewart believed that compliance-gaining messages are best classified in a power based model. "Power is access to influential resources. It is also a result of interpersonal perception, since people have as much power as others perceive that they have" (Littlejohn, 120).

The Wheeless group isolated power by three general types. The first is the perceived ability for the persuader to be able to manipulate the consequences of the course of action. An example of this, as it relates to our ERA situation, would be the endorsement of ERA by a high institute official such as the provost. The second type of power is the perceived ability to use one's relational position with the other person. If the university administration is not pleased with a researcher's uncooperative attitude toward converting to ERA, the target may decide to go along for fear of losing their job. The third type of power deals with the perceived ability to define values or obligations. In this scenario, the persuader has the credibility to be in a position to tell the target what norms of behavior are acceptable in a given situation. Being *sensitive to the needs of the university* is an example of this type of power.

In a compliance-gaining situation, according to the Wheeless group, the persuader accesses her power over the target and chooses the tactics that will invoke that power.

> "The ability to affect another person's expectations and consequences may
> lead to you to use tactics like promises, threats and warnings. The ability
> to manipulate the relationship may lead you to choose such tactics as
> saying you like the other person, attributing positive or negative esteem,
> making emotional appeals, flattering, and so on. The third category of
> power-defining values and obligations may lead you to use moral appeals,
> debt, guilt, and other similar techniques"(123).

Clearly, the views of the four compliance gaining methodologies presented here vary to some degree, yet they share fundamental similarities. All four present threat of punishment and promise of reward as fundamental elements of compliance gaining just as Festinger had initially proposed. Although the latter three research groups expand Festinger's original theory, the concepts remain the same. I recognize that the preceding strategies are rich in theory supported by empirical data. However, I believe there is still a missing piece to the notion of compliance particularly as we apply it to change in the workplace.

2.3 Management of Service Institutions – Peter Drucker

Our discussion on implementing change can be seen as two-fold. One issue is determining ways to gain compliance from those who will be affected by the change. We have explored methodology that will assist in gaining compliance. A second, equally important issue is actually incorporating the change into the setting at hand.

In "Technology, Management and Society," Peter Drucker cites resistance to change as one common misconception on the part of management. He states, "We will, therefore, increasingly have to learn to make existing organizations capable of rapid and continuing innovation. How far we are still from this is shown by the fact that management still worries about resistance to change. What existing organizations will have to learn is to reach out for change as an opportunity and to resist continuity." (36) He explains that one key for businesses to succeed in the future will be the knowledged worker. He defines this person as one who has put what she has learned to work to

enhance performance and effect change. We should look to change as a way to increase productivity and performance and, as such, achieve success.

In a later work, "Management-Tasks, Responsibilities, Practices" Drucker discusses the need for service institutions in particular to outline and impose on themselves Principles of Effectiveness to enhance performance and productivity. These principles translate well into the implementation of ERA.

1. They need to define "what is our business and what should it be".

2. They need to derive clear objectives and goals from their definition of function and mission.

3. They have to think through priorities of concentration which enable them to select targets, to set standards of accomplishment and performance, that is, to define the minimum acceptable results; to set deadlines; to go to work on results, and to make someone accountable for results.

4. They need to define measurements of performance.

5. They need to use these measurements to feed back on their efforts, that is, to build self-control from results into their system.

6. Finally, they need an organized audit of objectives and results, so as to identify those objectives that no longer serve a purpose or have proven unattainable. (158)

A clearly defined performance plan along with education and training can help eliminate fear of the unknown, which in itself produces dissonance, to enable change to take place.

CHAPTER 3

ORGANIZATION OF THE RESEARCH

3.1 Introduction

To design my study I combined elements of Lauer and Asher's Research Taxonomy

model and Porter and Coggin's Research Methodologies (11-17) to develop a figure that

will place this research in an appropriate domain with other like models. Figure 5 shows

the secondary sources that will be utilized to develop the instruments necessary to collect

the primary information and data. This primary information can then be reviewed to

evaluate the results of the study.

SECONDARY SOURCES
↓
books
↓
journals
↓
newsletters
↓
Government Documents
↓
Conference Proceedings
↓
On-line Information
↓
PRIMARY SOURCES
↓

| surveys | expert interviews | subject questionnaires | personal experience | personal knowledge |

↓
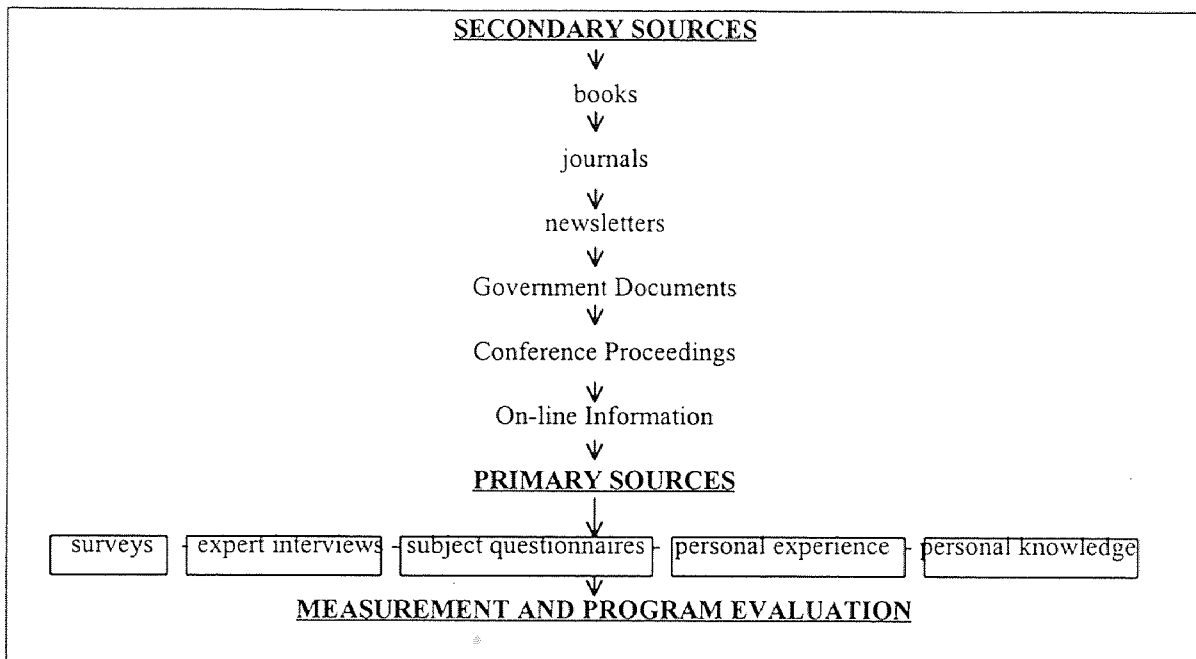**MEASUREMENT AND PROGRAM EVALUATION**

Figure 5. Research Taxonomy Model

Primary sources of information for final evaluation came in several formats. Of course the faculty questionnaire and expert interviews generate rich data for later analysis. However, my personal experience and knowledge of the subject matter also played a lead role in providing a valuable foundation for this study.

As the Director of Sponsored Programs, I am in a unique position. I am a professional research administrator and, as such, cannot deny the importance of ERA. Having participated in numerous debates and discussions with colleagues at NJIT and at other universities, I constantly receive updates on the status of ERA. Most recently, the National Science Foundation required electronic proposal submission for the first time. Based on my knowledge of ERA and my experience with it, I had to determine how to evaluate its implementation and impact.

In order to survey NJIT researchers and administrators to determine their readiness to convert to Electronic Research Administration, I first gathered information on other universities that have experienced success after implementation. As discussed, the concept of ERA is relatively new and, hence, limited information is available in print on the subject. Eight universities were selected for a demonstration project funded by the federal government. They were Pennsylvania State University, Massachusetts Institute of Technology, University of Notre Dame, Florida A&M University, UCLA, Baylor College of Medicine, Duke University and the Hutchinson Cancer Research Center. They have already resolved many problems associated with introducing ERA on a campus-wide basis and will provide valuable insight to this project.

Two institutions in particular Pennsylvania State University and Massachusetts Institute of Technology provided the basis for the structured interview portion of the research.

Informational interviews with recognized experts in the field can provide primary information in several ways. Porter and Coggin's (153) discuss four areas where informational interviews can be of particular value:

- Obtaining information that has not been produced in other forms;

- Verifying information discovered in other forms;

- Clarifying information; and

- Updating previously published information.

The informational interviews for this study were conducted with the pre-award official who headed the ERA implementation effort. Preliminary contact was made to outline the purpose of the interview and to discuss the information and statistics needed. Appointment times were then established. Certain information requested was in the form of close-ended questions such as statistical inquiries. These questions were followed by several open-ended questions. The complete list of interview questions can be found in Apendices A and B. The second phase of the research involved surveying NJIT personnel to determine readiness and willingness to convert to ERA. Seventeen active researchers were surveyed. An active researcher was defined as having submitted (as a principle investigator or co-investigator) at least one outside research proposal in fiscal year 1997. Certain general information was requested such as research volume, academic department, professorial rank and years at NJIT. The remaining questions were yes/no

and ranking/rating. They were largely based on information obtained from the expert

interview participants.

3.2 Selection of Subjects

The selection of subjects for the expert interview portion of the research was fairly

simple. When discussing ERA in any context, one individual's name will almost

always find its way into the conversation: Ms. Julie Norris. Ms. Norris, currently the

Director of Sponsored Programs at MIT, is nationally recognized by the two

professional organizations that support research administration; the National Council

of University Research Administrators (NCURA) and the Society of Research

Administrators (SRA). A past president of NCURA and it's first recipient of the

Lifetime Achievement Award, Ms. Norris has been a leader in promoting the

advancement of ERA at the university and federal levels. She has organized

numerous conferences on the subject and has chaired a multitude of sessions.

Robert Killoren, Director of Sponsored Programs at PSU, is a key player in the

development of ERA systems nationwide. Having cited his work many times earlier

in this report, it is obvious why he was chosen. He has been very prominent in the

ERA arena, particularly in Washington DC, from the time that ERA was little more

than a concept. He serves on numerous advisory committees and is generally

recognized as an expert.

The selection of subjects to participate in the faculty survey phase of this study

was more complex. Earl Babbie's description of stratification sampling was most

helpful in breaking down the entire faculty population. Although I knew from whom

the sample would be taken, I wanted to narrow the group down using research

performance and interest in ERA as qualifiers. As previously stated, it was essential

that active researchers, having submitted at least one research proposal in fiscal 1997,

were chosen. Fortunately, the Sponsored Programs Office at NJIT, of which I am

Director, maintains this information. Furthermore, I wanted to select faculty that had

an interest, whether positive or negative, in the process of developing and submitting

research proposals.

Additionally, I wanted my sample to be comprised mainly of independent

researchers who did not have the benefit of a large support staff or research center to

assist them in their submission efforts. I wanted to enlist the responses of those who

had line responsibilities for completing the work.

Finally, I wanted to have a sampling of faculty from as many schools,

departments, or disciplines as possible. Certain departments such as Computer and

Information Science or Electrical and Computer Engineering may be perceived as

having a technical advantage over others and I did not want any department to be

overrepresented.

3.3 Structured Interviews with Subject Matter Experts

3.3.1 Development and Design

As previously stated, the purpose of the structured interviews was to gather information

that would help to identify factors which would enhance ERA implementation at NJIT.

Questions were developed and administered in a topical sequence (McDowell, 26)

that would address three concepts of interest identified for ERA implementation; overall

management, technology and incentives.

Additionally, both interview subjects have extreme demands constantly being placed on their time. It was essential to keep the questions brief but detailed enough to target the information being sought, specifically the means and incentives needed for successful ERA implementation. McDowell outlines the characteristics of a focused, structured interview. He writes "a focused structured interview is concerned with a specific situation and focuses on topics that have been pre-determined. This type of interview will occur when both parties have had a common experience."(45) This approach worked especially well here in that I share the same position, title and job responsibilities as the two subjects. We all have the same concerns, use the same vocabulary and can relate on many levels.

3.3.2 Structured Interview Results

Results of the interviews with respect to each concept of interest are outlined below.

1. Overall Management and Resources:

   Questions related to overall management and resources were designed to identify what decisions and actions could take place, at a managerial level, to advance ERA implementation. In reviewing the responses, several common themes became apparent.

   Both subjects, for example, discussed the need for an ERA director or coordinator. Ideally, this person would possess a technical background along with knowledge of Sponsored Programs. Along the same lines, both subjects referred to their method to identify the needs of the university. PSU develops a task force while MIT launches what they refer to as a Discovery Project. Each area or department that will be affected by the changes will be represented on the investigation team, regardless of the fact finding techniques that each institution employs.

   Both subjects also made statements that discussed the effects that transdepartmental efforts had on ERA implementation. Cooperation is sought from

all areas of the university. At each institution, training efforts appeared to be most benefited by this team approach. Training became the responsibility of several departments. Among them were those who are considered to be experts in training and those with a knowledge of Sponsored Programs.

Finally, audience needs were discussed. The audience can take one of several forms. It can be the users who have a need for a system that is friendly and actually works. It could be the federal government, who has a need for universities to comply with new electronic proposal requirements. Lastly, the audience could be the administration which must have an eye for each of the other groups as well as cost/benefit to the university. Regardless of the audience, the experts stated and restated the necessity to address the audiences needs and, as such, attempt to gain their support.

2. Technology:

Technology as a concept of interest revealed several interesting responses. Initially, I sought responses such as types of software used. Although one software package, FoxPro, was mentioned by PSU, each subject offered much richer information.

The statement "ERA is not only about electronics" was particularly telling. When asked how a technical system was chosen or developed, each subject expressed the idea of independence and not accepting what was already out on the market. Each discussed the desire for leadership and being the forerunners in the ERA race by customizing their systems to meet the unique needs of their respective institutions. I detected great pride from each expert when explaining his or her approaches to selecting software. Both subjects wanted to address the needs of the research community by ensuring that the system would be user friendly. This was clearly stated as being critical for the successful implementation. Again, the idea of training was cited as vital. The best system was seen as a failure if the research community could not or would not use it.

3. Incentives:

It was imperative to include questions that would identify incentives for compliance. As discussed earlier, the Cognitive Dissonance Theory states that to achieve compliance you must not only have incentives, but they must be sufficiently important to the subject to bring about compliance. Incentives had to be discussed for not only ERA system direct users, but for the upper administration as well.

Each subject offered individual timesaving and efficiency as the biggest incentives to all users. Data would now be available to the general university population as never before. Both experts cited that their current ERA systems were advantageous to their faculty in that more information delivered in a timely fashion helped them to be more competitive in their proposal efforts. Adjectives such as simplistic, easier and user-friendly were also made by each expert. As they both stated, everyone wants and needs more time. ERA systems, as they see them, are vehicles to gain this time.

3.4 Faculty Surveys

3.4.1 Development and Design

Once incentives were identified through the structured interviews, I was able to construct the survey to distribute to the NJIT faculty subjects. The purpose of this survey was to evaluate their position on proposal development in general, ERA in specific.

Twenty surveys were distributed through NJIT e-mail system. Two reasons were cited for this decision: 1) easier distribution, return of responses and follow-up; and 2) it seemed contradictory to send out a survey on ERA on paper through regular mail.
At this stage of the study, I considered the survey to be a fact-finding tool. As a result, the survey consisted of fourteen closed-ended questions. Seven questions were yes/no responses and seven more used a Likert scale.(Babbie, 127) Seventeen surveys were

completed and returned. This represents approximately 10% of the faculty research population. The remaining three, despite repeated follow-up attempts, were unobtainable.

3.4.2 Faculty Questionnaire Results

Questions were coded, once again, according to the concepts of interest used in the structured interviews. The complete survey with codes listed can be found in Figure 6. The responses were organized into a spreadsheet (Table 1) which revealed a wealth of information.

1. Overall Management and Resources:

   Sixteen faculty (94%) responded that they would be willing to participate in a training program for an on-line proposal processing system. When asked if they would be willing to serve on a committee to select and evaluate proposal processing systems, eight faculty indicated that they agreed or strongly agreed with this statement. Five additional subjects stated that they didn't know. Perhaps this indicated that they would need more information on what would be required to fulfill this obligation. The four who declined were of the associate professor level and above with more than six years of service to the University. Perhaps they are already burdened with committee responsibilities or are involved in advancing in the faculty ranks. All assistant professors surveyed indicated that they would be willing or that they didn't know.

   Eleven respondents stated that they felt NJIT's current proposal processing system was acceptable. This surprised me at first. However, after consideration of the question I believe the use of the word **acceptable** may have been a poor choice. Acceptable implies that basic needs are being met which in this case is true. It does not indicate excellence. Perhaps wording such as "I am content with NJIT's proposal processing system" would have been more revealing.

Question eleven was designed to reveal how the researchers viewed NJIT's overall role in the proposal process. Nine respondents agreed that NJIT supported their efforts. Six more were unsure, perhaps indicating that there was room for improvement but that they were not disillusioned. Only two indicated that they didn't feel the University had a supportive role. Interestingly, one of these four was an associate professor who had been at NJIT for twenty years (the longest tenure of all survey recipients.)

2.   Technology:

In soliciting information on technology, I wanted to learn three things; 1) Did the researchers have the hardware/software they needed to utilize ERA systems and 2) If they had it, did they or would they use it and finally 3) Were they happy with what they had.

Nearly all respondents reported that they had an office PC with web-browsing software and high-speed access to the internet. This was not surprising at a technological university. 71% of the respondents were familiar with NSF Fastlane although only 24% have explored it. Of the four who have explored Fastlane, two are new assistant professors who have been at NJIT only two years. Since this technology is very new, as are their experiences at NJIT, they have been especially flooded with pro-Fastlane information. This is what they know. The other two who have explored Fastlane are Electrical and Computer Engineering faculty, who, by nature of their department, have shown a great interest in computer advances.

One of the most surprising findings, however, is that although nearly every faculty member surveyed has the necessary hardware/software, only five responded that they were content with what they had. Nearly half expressed that they were not. This could indicate a general dissatisfaction with the quality of their equipment or perhaps they are unfamiliar with many of the electronic possibilities currently within their reach. This finding warrants further investigation.

3. <u>Incentives</u>:

In this section, I wanted to uncover what benefits of ERA the NJIT faculty found to be of value. As discussed in Cognitive Dissonance Theory, incentives to comply must be sufficiently important and relevant to the subject to elicit compliance.

A user-friendly database to match faculty research interests was overwhelmingly seen as an incentive. NJIT currently has a database for this purpose which is seen as cumbersome to use and maintain. With the support of 76% of the respondents, this incentive is most important for follow up.

The faculty appeared to be split when asked if they would submit more proposals if a proposal routing system were in place. The two who emphatically stated that they strongly disagreed with the statement submitted a combined total of eleven proposals last year. Perhaps they feel they are already at maximum output level and cannot do more. However, two extremely active researchers, having submitted twelve proposals total during FY 97, felt that they would be even more productive.

The only faculty member for which I was unable to identify any incentives was subject number seven. This is also the same subject who firmly stated that he would not submit his own proposals even if he had the means. He also stated that he does not wish to participate in the selection of a new ERA pre-award system. It would be helpful, once again, to conduct a more in-depth open-ended interview to better assess the needs of this individual.

Faculty Questionnaire					
With Concepts of Interest Identified					

As an active member of the NJIT research community, you have been selected to receive a short questionnaire on the subject of Electronic Research Administration. I have kept the questions brief and to the point Please take a moment to reply and forward your responses to me at lvr001@megahertz by November 26, 1997. If you have any questions or comments, please call me at 596-3432. I appreciate your cooperation.

Name:
Professorial Rank:
Department:
Years at NJIT:
Number of Research Proposals Submitted, or participated in, during Fiscal Year 1997 (7/1/96-6/30/97):

Please respond yes or no to questions 1-7

1. Do you have a personal computer with Web browsing software?   T

2. Do you have a high-speed connection to the Internet?   T

3. Do you utilize the Internet to search for funding opportunities?   T

4. Are you familiar with NSF Fastlane?   T

5. Have you explored the options available on NSF Fastlane?   T

6. If NJIT offered an on-line proposal processing system, would you use it?   OM

7. Would you be willing to participate in a training program for the above system?   OM

Please indicate your response for questions 8 – 14.

Strongly Agree	Agree	Don't know	Disagree	Strongly Disagree	
8. I would be willing to serve on a committee to evaluate preaward electronic grant processing software.					OM
9. NJIT's current proposal routing system is acceptable.					I

Figure 6. Faculty Questionnaire with Concepts of Interest Identified

**Faculty Questionnaire
With Concepts of Interest Identified**

10. I would submit   I
more proposals if a pre-
award proposal routing
system were in place.

11. NJIT supports the   OM
the proposal develop-
ment needs of the
individual researcher.

12. I am content with   OM
the hardware/software
currently available to
me at NJIT.

13. A database to identify   I
other faculty with similar
research interests would
be helpful to me.

14. If I had the means,   I
I would prefer to submit
my own proposals
electronically.

Figure 6. (Continued)

TABLE 1.

FACULTY SURVEY
RESULTS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Years	8	8	5	3.5	7	2	11	6	11	5.5	2.5	9	6	2	10	20	4
Rank	D.P	ASO	AST	AST	ASO	AST	ASO	ASO	ASO	ASO	AST	PRO	ASO	AST	ASO	ASO	AST
Dept.	PHY	MATH	ME	CIS	SOM	CIV	EE	EE	EE	PHY	PHY	EE	PHY	CIV	PHY	ARCH	SOM
# of prop.	4	4	8	2	4	8	3	3	4	10	6	6	7	4	8	3	3
1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
2	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y
3	Y	N	N	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y
4	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N
5	N	N	N	N	N	Y	Y	N	Y	N	Y	N	N	N	N	N	N
6	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
7	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	D	E	A	B	A	A	E	C	A	C	B	C	E	C	A	A	C
9	B	B	B	D	D	B	B	B	B	D	B	D	C	A	B	E	B
10	B	C	C	D	C	D	D	D	E	C	A	B	E	B	A	B	A
11	B	C	C	D	B	A	C	B	B	B	C	C	A	A	C	D	B
12	C	C	D	D	D	B	B	B	B	D	C	C	B	D	D	D	D
13	A	B	A	B	B	A	C	C	B	A	A	B	C	B	A	A	A
14	A	C	C	A	C	B	E	C	A	D	C	B	A	D	A	A	C

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

4.1 Conclusions

It is evident that the two-part investigation conducted and presented in this report has yielded a multitude of data. Some of it was anticipated. Portions were a surprise and as such warrant further investigation. Yet all of it was important and useful. Many conclusions can be drawn from the common threads found in the responses of the participants, thus allowing for the development of a progressive implementation plan.

The structured interviews showed how vital it is to have a director and an overall plan for ERA implementation. In the case of PSU, a task force was created. MIT chose to embark on a Discovery Project. Regardless of the name chosen, clearly a representative transdepartmental group must be assembled to give the plan focus and direction. Needs of the users must be assessed with consideration of the concerns for the well being of the entire university. Without this fact-finding phase, ERA implementation will most likely fail. The concept of plan development, goal setting and assessment fits will with Peter Drucker's Principles of Effectiveness for service organizations. Goals, outcomes and productivity are common themes.

Each interview subject also emphasized a comprehensive training program. Creating a system that people can actually use and then showing them how to use it was a critical message which few could argue with. Fear of the unknown is a dissonance-producing situation. Giving users the knowledge and tools they need to be successful shines light on the subject and can reduce dissonance. This point can be further reinforced through the responses of the faculty. Sixteen respondents (94%) indicated willingness to participate in a training program for an on-line proposal processing system.

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Comprehensive training would empower the users to be in charge of their own performance so emphasized by Drucker.

The necessity to build a customized system is a very important conclusion that can be drawn from both the structured interviews and the faculty surveys. Both subjects indicated that utilizing an existing system with its limitations was unacceptable. A customized system, they seemed to indicate, would allow for greater efficiency on the part of their administrators and be a competitive advantage to their researchers. This was echoed by the 76% of NJIT faculty who said a database to identify faculty with like interests would be beneficial to them. A new database, customized to their needs, can be seen as a dissonance reducing incentive in that it could make them more competitive. It also bears mentioning that 47% of the faculty indicated they would be willing to serve on a committee that would make the system a reality. They are taking an active interest in decisions that will affect their futures and those of their colleagues. In essence, they are serving as leaders. Recognition (i.e.: rewards) is a very powerful incentive.

I believe that this study did identify incentives sufficient to produce willingness on the part of NJIT faculty to comply with ERA. Perhaps the rich and abundant data collected can be used to assist in determining the future direction of NJIT as electronic research administration becomes less of a concept and more of a way of life.

4.2 Recommendations for Future Research

In depth interviews with certain NJIT faculty participants should be conducted to clarify certain data inconsistencies. For example, subject seven appeared to have had experiences that made ERA prohibitive to him. It would be helpful to identify if these experiences were unique to his situation, or if they could be more commonly seen and addressed.

Another inconsistency, as mentioned previously, is the response given for faculty question twelve. Great discontent was expressed for the existing hardware/software yet

nearly all respondents reported having the tools necessary for using ERA systems. An
additional open-ended question to explore this would be valuable

4.3 Significance of the Research

The significance of this research is apparent in several areas. Initially I chose the topic
because it was of primary interest to me as a research administrator and I have a
professional commitment to this project. However, as I began to look for information on
the topic, I realized that there was a lack of credible publications on the subject and I
quickly realized that any case studies in this area would be valuable to the field. I also
believe that this is an exciting topic in that it reflects future trends that are becoming more
of a reality on a daily basis. Finally, I feel that the outline of the research and the methods
that will be used are applicable to other situations where an innovative idea must be
implemented.

APPENDIX A

INTERVIEW RESPONSES

Expert 1 – Robert Killoren

1. **What is your position within your University?**

   "Director of Sponsored Programs."

2. **How many research faculty members are currently on staff in your University?**

   "I believe about 4000."

3. **What initial groundwork or research did you do prior to recommending the implementation of ERA?**

   "Well, we wanted to see where the Federal Government was at because we didn't want to get ahead of them. Once we saw that we decided to build our own pre-award database."

4. **What advice can you offer to a university who is just about to embark on this project?**

   "Be careful not to choose a system too quickly. Some schools did and now regret it because technology has leapfrogged. Also, appoint an ERA director. We have user groups for new systems and constantly work with them to update the system. Another thing to do would be to delegate the responsibility for standard submissions to the departments now."

5. **ERA implementation can be an expensive proposition in terms of hardware, software and infrastructure. How did you convince the administration of your University to "buy in" to ERA?**

   "ERA is not only about electronics. It's about the way your business systems work. Highlight the improvements. Start off by showing small improvements to gain interest and momentum."

6. **What was the main problem(s) you experienced?**

   "There was a crisis in the Research Accounting area and support for ERA died out."

7. **How did you resolve the problem(s)?**

"Rather than rely on others to develop our system, we went ahead on our own. We started with a task force to determine which way to go. We then got a new VP who made ERA a priority."

8. **Do you utilize an automated proposal routing system? If so, what are the main benefits you have received from this system?**

"Yes, we use FoxPro self-built software. It's an on-line grant database in our office where PI's can call up contracts at any point during the negotiation stage. It eliminates multiple steps and the PI's love it. This database benefits PI's but also the rest of the College. The Provost, the P&T committee. There are less phone calls. We can provide daily award reports to the colleges as well as negotiation reports."

9. **What is the single most important element in the implementation of ERA?**

"People must remember that to maintain competitiveness, we must have compliance with ERA."

10. **What type of training did you offer users?**

"We offer 7-8 workshops per year internally to train staff and faculty on using our database."

11. **What is the most common complaint you hear from researchers?**

"I really don't hear many complaints. I used to hear that things always got lost along the way but not now.

12. **Can you identify the single biggest incentive for faculty to utilize various ERA systems?**

"Again, less phone calls, less time. Things don't get lost. We are currently working on an internal electronic approval system that will really make things easier."

13. **What is the most common praise you hear in favor of ERA?**

"Saves time for everyone involved, administrators, researchers, the Provost etc. Everyone wants more time."

APENDIX B

INTERVIEW RESPONSES

Expert 2 – Julie Norris

1. **What is your position within your University?**

"Director of Sponsored Programs."

2. **How many research faculty members are currently on staff in your University?**

"We have 900 faculty but MIT has a heavy number of well funded divisions, labs and centers, DLC's we call them that do about 70% of our volume. Including them, the number is approximately 1800."

3. **What initial groundwork or research did you do prior to recommending the implementation of ERA?**

"This one is easy. When I came to interview in April 1994, one of the things I talked about was an electronic system. At that time, we couldn't tell you anything but expenditure information. There was no award management information. I had it in my letter of employment that a needs analysis would be done for electronic research administration systems and was given the authority to carry it out."

4. **What advice can you offer to a university who is just about to embark on this project?**

"Do a needs analysis study. At MIT we call these Discovery Projects. You must also have one full-time dedicated person who is a techie with a knowledge of sponsored research. Don't piece meal the project. This is a recipe for failure."

5. **ERA implementation can be an expensive proposition in terms of hardware, software and infrastructure. How did you convince the Administration of your University to "buy in" to ERA?**

"When you do your Discovery programs, be sure to include a cost/benefit analysis. We had to decide 'where does MIT want to be?' A leader or a follower. MIT has many types of proposals. We needed a custom system that could accommodate this. Rather than accept what was out there, we wanted to be first. This will be a great advantage to our faculty."

6. What was the main problem(s) you experienced?

"We really didn't have much criticism. Rather suggestions from faculty to be sure that the system was user friendly."

7. How did you resolve the problems(s)?
"We had a user group as part of our Discovery project to work on this."

8. Do you utilize an automated proposal routing system? If so, what are the main benefits you have received from this system?

"We are working on it now. It was our first priority to develop a FRS system.

9. What is the single most important element in the implementation of ERA?

"The most important element from my experience has been to get the support of the users."

10. What type of training did you offer users?

"We offer face to face hands on training as well as individual training. We developed a schedule for training with our HR training office. They are currently meeting to develop a comprehensive training program to roll out on a department by department basis. The design of the training is going to be done by people who are experts. My staff will be present at the training to answer questions."

11. What is the most common complaint you hear from researchers?

"We often hear KISS, keep it simple, stupid. The faculty really doesn't want to do things that differently."

12. Can you identify the single biggest incentive for faculty to utilize various ERA systems?

"That it will make their lives much easier."

13. What is the most common praise you hear in favor of ERA?

"We often hear praise from the administrators For example, when preparing the current and pending support information. It will now be absolutely simplistic. No more running from office to office, file to file gathering information."

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