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An Evaluation of Selected NASA Scientific and Technical Information Products: Results of a Pilot Study

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AN EVALUATION OF SELECTED NASA SCIENTIFIC AND TECHNICAL INFORMATION PRODUCTS: RESULTS OF A PILOT STUDY

INTRODUCTION

A pilot study was conducted to evaluate selected NASA scientific and technical information (STI) products. The study, which utilized survey research in the form of a self-administered mail questionnaire, had a two-fold purpose -- to gather baseline data regarding the use and perceived usefulness of selected NASA STI products by aeronautical engineers and scientists and to develop/validate questions that could be used in a future study concerned with the role of the U.S. government technical report in aeronautics.

Specific objectives for the study fell into four general classes. The first was to solicit the opinions of aeronautical engineers and scientists regarding their use of STI and NASA STI and the importance of NASA STI; second, to solicit the opinions of aeronautical engineers and scientists regarding the use and usefulness of NASA announcement and current awareness media; third, to learn how aeronautical engineers and scientists obtain NASA technical reports and to solicit their opinions regarding changes in NASA technical reports; last, to solicit the opinions of aeronautical engineers and scientists regarding the quality (prestige) of NASA-authored journal articles and technical reports and the organization (format), the adequacy and accuracy of data, and the quality of visual presentations in NASA technical reports.

Data were collected by means of a self-administered mail questionnaire shown in Appendix A. The questionnaire was pretested at the NASA Ames Research Center and the McDonnell Douglas Corporation in St. Louis. Members of the American Institute of Aeronautics and Astronautics (AIAA) comprised the study population. The sample frame consisted of approximately 25 000 AIAA members in the United States (U.S.) with

academic, government, or industrial affiliations. Simple random sampling was used to select 2000 individuals from the sample frame to participate in the pilot study. Three hundred fifty-three (353) usable questionnaires were received by the established cutoff date. The study, which spanned the period from May 1988 to October 1988, was conducted in conjunction with Old Dominion University under NAS1-18584, Task 21, to help ensure objectivity and confidentiality, to maintain the integrity of the study, and to obtain research skills not readily available to the project.

GLOSSARY

AIAA	American Institute of Aeronautics and Astronautics
IAA	International Aerospace Abstracts
LaRC	Langley Research Center
NASA	National Aeronautics and Space Administration
PC	Personal Computer
RECON	Remote Console
SCAN	Selected Current Aerospace Notices
SPSS-X	Statistical Package for the Social Sciences-X
STAR	Scientific and Technical Aerospace Notices
STI	Scientific and Technical Information
U.S.	United States

RELATED RESEARCH AND LITERATURE

The search for sources of related research and literature included (1) searches of print and computerized databases and (2) books, periodicals, reports, conference proceedings, and bibliographies. The search topics included engineers and information use, use and users of STI, use and users of technical reports, and the evaluation of NASA STI products and the NASA STI system.

The related research and literature was organized around two topics -- (1) the evaluation of NASA STI products and the NASA STI system and (2) the production,

transfer, and use of STI by engineers -- and was used to develop the conceptual framework for the study. Significant research studies pertaining to these topics are presented in the "Overview of NASA STI Studies" and in the "Overview of Engineering STI Studies." Although not comprehensive, the studies included in the overviews are fairly representative of the research and literature related to the two topics. Data from the related research and literature are included in this section under the corresponding study objective.

OVERVIEW OF NASA STI STUDIES

Year	Principal Investigator	Research Method	Population	Sample Frame	Sample Design	Sample Size	Response Rate Percentage	Description
1973	Drobka	Structured interview	All NASA aerospace technologists	11 593	Non-probability	114	100	Survey of NASA aerospace technologists to determine the effectiveness of the NASA STI system
1978	Burr	Structured interview	All NASA aerospace technologists	10 822	Non-probability	76	100	Survey of NASA aerospace technologists to determine the effectiveness of the NASA STI system
1979	Monge	Structured interview Self-administered questionnaire	All NASA technical report subscribers	643	Census	643	70 (450)	Survey of aerospace executives, librarians, and researchers to determine the effectiveness of the NASA STI system
1980	Pinelli	Structured interview Self-administered questionnaire	All NASA-LaRC aerospace technologists	1 270	Census 300 completed questionnaires were randomly selected for analysis	1 270	56 (710)	Survey of NASA LaRC personnel to determine their knowledge of and attitudes toward NASA STI
1981	Pinelli	Self-administered questionnaire	List of 1200 academic and industrial professionals; 600 addresses verified; 487 willing to participate	487	Dillman's total design method for telephone and mail surveys	487	77 (381)	Survey of academic and industrial personnel to determine their knowledge of and attitudes toward NASA and LaRC STI
1982	McCullough	Document analysis	Society for technical communications					Survey and analysis of technical report practice and usage
1982	Pinelli	Self-administered questionnaire	Internal All NASA-LaRC aerospace technologists	1 026	Probability every second man was selected to participate	513	75 (383)	Survey of NASA-LaRC personnel and non-NASA personnel to obtain reader preferences regarding NASA technical report format
			External All members of three professional societies; 1400 potential respondents; 896 addresses verified; 600 willing to participate	600	Dillman's total design method for telephone and mail surveys	600	85 (511)	

OVERVIEW OF ENGINEERING STI STUDIES

Year	Principal Investigator	Research Method	Population	Sample Frame	Sample Design	Sample Size	Response Rate Percentage	Description
1954	Herner	Structured interview	All scientific and technical personnel at Johns Hopkins	Unknown	Unknown	600	100	Survey to determine the information-gathering methods of scientific and technical personnel at Johns Hopkins
1970	Rosenbloom and Wolek	Self-administered questionnaire	Members of 5 industrial R&D organizations Members of 4 IEEE interest groups	2 430 Unknown	Census Probability	2 430 Unknown	71 (1 735) Unknown (1 034)	Survey to determine how engineers and scientists in industrial research and development organizations acquire STI
1977	Allen	Record analysis Self-administered questionnaire	Unknown	Unknown	Unknown	Unknown	Unknown (1 153)	Survey to determine technology transfer and the dissemination of technological information in research and development organizations
1980	Kremer	Self-administered questionnaire	All design engineers at one engineering design firm	73	Census	73	82 (60)	Survey to identify and evaluate the information channels used by engineers in a design company
1981	Shuchman	Structured interview Self-administered questionnaire	Engineers in 89 R&D and non-R&D organizations	14 797	Probability	3 371	39 (1 315)	Survey to determine information use and production in engineering
1983	Kaufman	Self-administered questionnaire	Engineers in six technology based organizations	147	Census	147	100 (147)	Survey to determine the use of technical information in technical problem solving

Use of STI and Importance of NASA STI

Engineers and scientists are ardent consumers of STI. This characteristic is no less true for those engineers and scientists who participated in the NASA STI studies. Participants in the NASA STI studies did not display a preference for one form of STI; there was fairly even distribution in the use of conference/meeting papers, journal articles, and technical reports. Herner (1954), Rosenbloom and Wolek (1970), Allen (1977), and Kaufman (1983) found that engineers and those scientists working in applied areas make considerable use of technical reports. Shuchman (1981), in her study of engineers, found that aeronautical engineers use technical reports more than engineers in other disciplines.

Previous NASA STI studies indicate that NASA STI is important and is used by aeronautical engineers and scientists. Approximately 84 percent of the respondents

in the Pinelli (1981) study indicated that NASA STI is important in terms of "advancing the state-of-the-art".

The Use and Usefulness of NASA Announcement and Current Awareness Media

The NASA STI collection of 3.0 million documents (1.2 million NASA-originated) grows by approximately 80 000 (20 000 NASA-originated) documents annually. A variety of information products are used to provide awareness of and access to NASA STI. Scientific and Technical Aerospace Reports (STAR) is an announcement journal that covers worldwide aerospace technical reports, technical report translations, foreign and domestic patents and NASA patent applications, and foreign and domestic dissertations. International Aerospace Abstracts (IAA) is an announcement journal that covers worldwide aerospace journal articles, books, conference/meeting papers, cover-to-cover journal translations, and certain foreign and domestic dissertations. The subject scope of STAR and IAA includes all aspects of aeronautics and space research and development, supporting basic and applied research, and applications. Aerospace aspects of earth resources, energy development, conservation, oceanography, environmental protection, urban transportation, and other topics of high priority are also covered. Selected Current Aerospace Notices (SCAN) is a current awareness publication that supplements STAR and IAA by providing computer-generated citations to new documents in the NASA STI database of special interest to users. The NASA STI database is accessible through RECON (Remote Console), the NASA computerized on-line interactive retrieval system. The unclassified, unlimited portion of the NASA STI database is accessible through DIALOG via the Aerospace Database.

The Drobka (1973), Burr (1978), and Pinelli (1980,1981) studies collected data on the use of STAR, IAA, SCAN, and RECON. Data from these studies on the use of STAR, IAA, SCAN, and RECON follow. Additional data on the usefulness of these four media are given in Appendix B.

USE OF NASA ANNOUNCEMENT AND CURRENT AWARENESS MEDIA

(All Values Are Percentages)

Study	Year/ Number	MEDIA			
		STAR	IAA	SCAN	RECON
Drobka	1973 n=114	67	56	51	52
Burr	1978 n=76	45	34	45	79
Pinelli	1980 n=300	84	76	49	69
Pinelli	1981 n=381	66	48	33	52

Use of the NASA announcement and current awareness media varies with NASA personnel using these media more than non-NASA personnel. STAR is the most used of the four media. Respondents in both the Drobka (1973) and Burr (1978) studies found the four media (see Appendix B) easy to use, the announcement/database current, the scope and coverage adequate, the category scheme adequate, and that RECON searches met the users requirements.

With the possible exception of STAR, participants in the NASA STI user studies indicated "moderate" use of NASA announcement and current awareness media. Herner (1954), Allen (1977), and Shuchman (1981) found that engineers and those scientists working in the applied areas tend to prefer informal and personal sources of information over such formal information sources as printed indexes and bibliographies.

How NASA Technical Reports Are Obtained and Reaction to Changes in NASA Technical Reports

Approximately 30 percent of the respondents in the Monge (1979) study indicated that they learned about NASA technical reports through newsletters prepared by their corporate library or information center/service; 21 percent indicated that they

learned about NASA technical reports through STAR. The next most frequently used sources of information about NASA technical reports were NASA contacts (15%) and reading professional journals (15%), followed closely by contacts with colleagues inside the company (12%). SCAN and colleagues outside the company ranked at the bottom of the list with 4 percent and 2 percent, respectively.

Approximately 50 percent of the respondents in the Monge (1979) study indicated that they received NASA technical reports through the automatic distribution program. Librarians were asked by Monge (1979) to indicate why NASA technical reports were not available in the company library or information center. Approximately 55 percent of the librarians responding indicated that the technical report was listed in STAR but was not on automatic distribution; approximately 20 percent indicated that the technical report was supposed to be automatically received but was not.

Respondents to the Monge (1979) study indicated that NASA technical reports were used most frequently to maintain professional awareness followed by providing new ideas, followed by validating their own research. Respondents indicated that NASA technical reports were less important in terms of saving their company money and for saving work hours.

The Monge (1979), McCullough (1982), and Pinelli (1982) studies were devoted in part or in total to the format, appearance, and organization of NASA technical reports. Respondents to the Monge study were specifically concerned with what they perceived as the inconsistent application of NASA publication standards to NASA technical reports, the absence of detailed summaries and abstracts, the policy of NASA to exclude conclusions, the failure to relate research results to previous or existing work, insufficient tabular data, and the exclusion of negative data or findings. The use of varied type sizes and styles, the absence of grids on graphs, and the type of binding used for certain NASA technical reports were specified concerns of respondents to the Monge study.

McCullough (1982) undertook a study to determine the extent to which the standards for NASA technical report preparation contributed to the effectiveness of the NASA technical report as a product for information dissemination. The degree of effectiveness was established by (1) surveying and analyzing current practice and usage using selected technical reports; (2) surveying and examining the available literature relative to the sequential, language, and presentation components of technical reports; and (3) to compare the NASA technical report publications standards with the findings. Overall, NASA technical report publications standards compared favorably with current practice and usage.

Pinelli (1982) conducted a study of NASA and non-NASA engineers and scientists to determine their preferences regarding NASA technical report format. Respondents indicated that a summary as well as an abstract should be included, that the definition of symbols and glossary of terms be located in the front of the report, and that illustrative material be integrated with the text rather than grouped at the end of the report. Citation by number was the preferred format for references; a one-column, ragged right margin was the preferred layout; and third person, passive voice was the preferred study of writing for technical reports.

The changes to NASA technical reports proposed by this study were based on the use of computer and information technology. In this study (1989), respondents were asked their likelihood/willingness to use an information product, traditionally packaged as a paper product, that would be repackaged in an electronic format. The related research and literature did not reveal any studies or experiments where users were asked to "test" an information product that had been converted to an electronic format. The related research and literature did, however, indicate that the likelihood of acceptance or use would depend upon such factors as previous exposure to computer and information technology, familiarity with and availability of computer and information technology, and actual use of computer and information technology.

Shuchman's (1981) study revealed a fairly low consistent use of information technology by engineers in six major disciplines. However, Shuchman's findings revealed that aeronautical engineers were the highest users of information technology and viewed information technology as having "high potential" for the use and production of information.

The Quality (Prestige) of NASA LaRC-Authored Journal Articles and Technical Reports -- the Organization (Format), Adequacy and Accuracy of Data, and the Quality of Visual Presentations in NASA Technical Reports

The review of related research and literature revealed few studies specifically concerned with the quality of technical reports. In most cases, the scientific journal was used as the standard for comparison. Much of the debate surrounding the technical report vis-a-vis the scientific journal centers around four themes: 1) availability, 2) quality, 3) diversity of content, and 4) status as a primary publication. According to Subramanyam (1981), the uneven quality of technical reports, in general, may be attributed to the following factors:

- Most technical reports are written by engineers or technologists.
- Most technical reports are addressed to the technical experts of the sponsoring agency and not the entire scientific and technical community.
- Most technical reports are intended to be working documents and not part of the archival literature of science and technology and, therefore, are not refereed by outside experts.
- Technical editing expertise and facilities available for report production are usually very limited.

NASA publication policy establishes the review and approval procedure for documents in the NASA technical reports series. This review is designed, in part, to ensure the technical quality of documents published in the NASA technical report series (NHB 2200.2). The technical review process and procedure is the responsibility of the various NASA field centers and installations.

Overall, the quality (prestige) of LaRC-authored journal articles and technical reports was perceived as being higher by LaRC than by non-LaRC engineers and

scientists (Pinelli (1980,1981)). Fifty-six percent and 35 percent, respectively, of the LaRC and non-LaRC engineers and scientists indicated that the prestige of LaRC-authored journal articles was high compared to other journal articles in their disciplines. Forty-eight percent and 41 percent, respectively, of the LaRC and non-LaRC engineers and scientists indicated that the prestige of LaRC-authored technical reports was high compared to other technical report literature in their discipline.

Respondents to the Pinelli (1980,1981) studies were also asked to assess the organization (format) and the adequacy of data in LaRC-authored technical reports. A comparison of responses from the two studies appears on page 11.

Seventy-one percent and 47 percent, respectively, of the LaRC and non-LaRC engineers and scientists indicated that the organization (format) of LaRC-authored technical reports made readability easy. Seventy-two percent and 48 percent, respectively, of the LaRC and non-LaRC engineers and scientists indicated that the data contained in LaRC-authored technical reports were sufficient.

A COMPARISON OF THE PRESTIGE, ORGANIZATION, AND ADEQUACY OF DATA FOR LaRC-AUTHORED JOURNAL ARTICLES AND TECHNICAL REPORTS

(All Values Are Percentages)

	LaRC Engineers and Scientists 1980					Non-LaRC Engineers and Scientists 1981				
	High	Neither	Low	No Opinion	Total	High	Neither	Low	Unfamiliar With	Total
When compared to other journal articles in my discipline, the prestige of LaRC-authored journal articles is higher	57	16	8	19	100	35	42	5	18	100
When compared to other technical report literature in my discipline, the prestige of LaRC-authored technical reports is higher	48	15	23	14	100	41	36	5	18	100
When compared to other technical report literature, the organization (format) of LaRC-technical reports makes readability easy	71	15	5	9	100	47	32	3	18	100
When compared to other technical report literature, the adequacy of data in LaRC-authored technical reports is higher	72	12	3	13	100	48	32	2	18	100
			n=300					n=381		

Respondents to the Pinelli (1981) study were asked to assess the quality of visual presentations in NASA LaRC-authored technical reports. The responses to that question appear below.

NON-LaRC ENGINEERS AND SCIENTISTS

(All Values Are Percentages)

	High	Neither	Low	No Opinion	Total
When compared to other technical report literature, the quality of visual presentations in LaRC-authored technical reports is higher	49	30	3	18	100

n=381

Forty-eight percent of the respondents indicated that the quality of visual presentations in NASA LaRC-authored technical reports was high; 30 percent indicated that the quality was neither high nor low while 3 percent indicated that the quality was low.

The responses of the non-LaRC engineers and scientists (Pinelli (1981)) to the questions of quality (prestige), organization (format), adequacy of data, and quality of visual presentations for LaRC-authored technical reports compared favorably with the findings of the Monge (1979) study. It should be pointed out, however, that the Monge study was concerned with NASA technical reports while the Pinelli studies were concerned with only NASA LaRC-authored technical reports.

PRESENTATION AND DISCUSSION OF THE DATA

The questionnaire used in this study (1989) contained 24 questions; 18 were specifically concerned with selected NASA STI products and 6 were specifically devoted to collecting demographic information about the survey respondents. Demographic data are presented first followed by data regarding selected NASA STI

products which are grouped according to the four study objectives. The question as it appears in the questionnaire is presented first followed by the aggregated tallies to the question. Of the 2000 questionnaires mailed, 353 completed surveys (18 percent response rate) were returned by the established deadline. The data were analyzed using the Statistical Package for the Social Sciences-X (SPSS-X) designed for use with a personal computer (PC). Appendix C contains the aggregated tallies for the 353 questionnaires.

Cross tabulations were prepared to explore the relationships between the responses to the 18 questions and the organizational affiliations of the respondents. Organizational affiliation included academic, government (non-NASA), industry, and NASA. The "academic" category includes responses from academic and not-for-profit organizations. The "government" category includes non-NASA personnel. Since nominal and ordinal scales were used to collect the majority of the reported data, the Chi-square at the .05 level of statistical significance was used as the non-parametric test for relationships between the responses to the 18 questions and the organizational affiliations of the respondents. Appendix D contains the cross tabulations for the 18 questions. Only those cross tabulations found to be statistically significant are presented in this section.

Demographic Information About the Survey Respondents

Survey respondents were asked to provide information regarding their professional duties, type of organization, years of professional work experience, their AIAA interest group, their level of education, and their gender.

TABLE A

Text of Question 19

What are your present professional duties?

1 – Research	5 – Manufacturing/Production
2 – Administration/Mgt.	6 – Private Consultant
3 – Design/Development	7 – Service/Maintenance
4 – Teaching/Academic	8 – Marketing/Sales
	9 – Other _____

TABLE B

Summary: Professional Duties	Number	Percentage
Research	104	29.5
Administration/Management	67	19.0
Design/Development	134	38.1
Teaching/Academic	18	5.1
Manufacturing/Production	9	2.6
Private Consultant	6	1.7
Service/Maintenance	2	0.6
Marketing/Sales	6	1.7
Other	6	1.7
	352	100.0

Background data (Table B) collected as part of the survey revealed that approximately 38 percent of the respondents stated that their professional duties involved design/development while approximately 30 percent indicated research as their primary professional duty. Nineteen percent indicated that their professional duties involved administration/management. The "breakdown" of professional duties for the survey respondents closely approximates the breakdown of professional duties for the AIAA membership.

TABLE C

Text of Question 20

Type of organization where you work:

1 – Academic
2 – Industrial
3 – Not-for-profit
4 – Government (Non-NASA)
5 – NASA
6 – Other _____

TABLE D

Summary: Type of Organization	Number	Percentage
Academic	33	9.6
Industrial	205	55.5
Not-for-Profit	10	2.9
Government (Non-NASA)	58	16.6
NASA	45	12.9
Other	11	2.5
	362	100.0

Fifty-five percent of the respondents were affiliated with industrial organizations (Table D) followed by 16.6 percent who work with government (non-NASA) organizations. Almost 13 percent of the respondents work with NASA, while 9.6 percent of the respondents were affiliated with "academic" organizations.

TABLE E

Text of Question 21

How many years of professional work experience do you have? ____ years

TABLE F

Summary: Years of Professional Work Experience	Number	Percentage
1 to 5 years	57	16.1
6 to 10 years	64	18.2
11 to 15 years	31	8.8
16 to 20 years	38	10.7
21 to 30 years	90	25.5
31 or more years	67	20.7
	347	100.0

Approximately 35 percent of the respondents had 10 or fewer years of professional work experience (Table F), while approximately 54 percent had 20 or fewer years of professional work experience. Approximately 80 percent of the respondents had 30 or fewer years of professional work experience.

TABLE G

Text of Question 22

What is your AIAA interest group?

1 – Aerospace Science
2 – Aircraft Systems
3 – Structures, Design and Test
4 – Propulsion and Energy
5 – Aerospace and Information Systems
6 – Administration/Management
7 – Other _____

TABLE H

Summary: AIAA Interest Group	Number	Percentage
Aerospace Science	128	37.1
Aircraft Systems	40	11.6
Structures, Design and Test	49	14.2
Propulsion and Energy	61	17.7
Aerospace and Information Systems	27	7.8
Administration/Management	14	4.1
Other	26	7.5
	345	100.0

Just over 37 percent of the respondents selected aerospace science as their AIAA interest group (Table H) followed by propulsion and energy with approximately 18 percent. The third most frequently selected AIAA interest group was structures, design and test (14.2 percent) followed by aircraft systems with approximately 12 percent.

TABLE I

Text of Question 23

What is your level of education?

1 – No degree
2 – Bachelors
3 – Masters
4 – Doctorate
5 – Other_____

TABLE J

Summary: Level of Education	Number	Percentage
No degree	1	0.3
Bachelors	93	26.4
Masters	156	44.3
Doctorate	102	29.0
	352	100.0

One respondent reported having less than a bachelors degree (Table J) while approximately 26 percent held only a bachelors degree. Just over 73 percent of the respondents held graduate degrees with about 44 percent having a masters degree and 29 percent a doctorate.

TABLE K

Text of Question 24

What is your gender? 1 – Male 2 – Female

TABLE L

Summary: Gender	Number	Percentage
Male	337	95.5
Female	16	4.5
	353	100.0

Approximately 95 percent of the respondents were male (Table L), while approximately 5 percent were female.

Survey Objective 1: The Use of STI and NASA STI and the Importance of NASA STI

To determine the use of STI, NASA STI, and the importance of NASA STI, survey respondents were asked 10 questions. They were asked to indicate their use of various STI products including those produced by NASA. If respondents did not use NASA technical reports, they were asked to indicate their reason for "non" use. They were also asked to indicate their attendance of NASA-sponsored conferences and meetings and to rate the importance of these conferences and meetings as a source of information for their research. Finally, respondents were asked to rate NASA-authored STI in terms of "advancing the state-of-the-art" in their disciplines.

TABLE M

Text of Questions 1 - 8

Which of the following sources of information do you use in your research?

1. __Yes __No Conference/meeting papers
2. __Yes __No Academic technical reports
3. __Yes __No Technical reports from industry
4. __Yes __No Journal articles
5. __Yes __No Government technical reports (Non-NASA)
6. __Yes __No NASA-authored conference/meeting papers
7. __Yes __No NASA-authored journal articles
8. __Yes __No NASA technical reports ... if NO ...
   1 2

TABLE N

Summary: Sources of Information Used in Research	Yes		No		Total	
	No.	%	No.	%	No.	%
Conference/meeting papers	297	84.6	54	15.4	351	100
Academic technical reports	197	56.3	153	43.7	350	100
Technical reports from industry	269	76.9	81	23.1	350	100
Journal articles	304	86.6	47	13.4	351	100
Government technical reports (Non-NASA)	248	70.7	103	29.3	351	100
NASA-authored conference/ meeting papers	233	66.6	117	33.4	350	100
NASA-authored journal articles	241	68.7	110	31.3	351	100
NASA technical reports	274	77.6	79	22.4	353	100

As shown in Table N, respondents did not display a decided preference for one form of STI; there was fairly even distribution in the use of conference/meeting papers, journal articles, and technical reports. Approximately 87 percent of the respondents used journal articles and 85 percent of the respondents used conference/ meeting papers. With the exception of academic technical reports (56.3%), use of NASA technical reports (77.6%), technical reports from industry (76.9%), and non-NASA, government technical reports (70.7%) was fairly consistent.

Use of NASA STI was fairly consistent. NASA technical reports were used by almost 78 percent of the respondents followed by NASA-authored journal articles with an approximately 69 percent use rate. NASA-authored conference/meeting papers were used by nearly 67 percent.

As with respondents in previous NASA STI studies and previously cited engineering STI studies, the respondents in this study are also ardent consumers of STI. The

fairly even distribution (use) of STI and NASA STI is fairly consistent with previous studies.

Cross tabulations were used to compare respondents' "organizational" affiliations with their use of STI products. As shown in Table O, academic (95.2%) and NASA (91.9%) respondents were most likely to use conference/meeting papers.

TABLE O

Comparison of Usage Rates of Conference/Meeting Papers by Organizational Affiliation

	Academic		Industrial		Government		NASA		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Use	40	95.2	170	83.3	44	75.9	41	91.1	295	84.5
Non-Use	2	4.8	34	16.7	14	24.1	4	8.9	54	15.5
	42	100.0	204	100.0	58	100.0	45	100.0	349	100.0

Chi-Square is significant at $P < .05$

As shown in Table P, industrial (84.7%) and NASA (80.0%) respondents were most likely to use technical reports from industry.

TABLE P

Comparison of Usage Rates of Technical Reports from Industry by Organizational Affiliation

	Academic		Industrial		Government		NASA		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Use	24	57.1	172	84.7	35	60.3	36	80.0	267	76.7
Non-Use	18	42.9	31	15.3	23	39.7	9	20.0	81	23.3
	42	100.0	203	100.0	58	100.0	45	100.0	348	100.0

Chi-Square is significant at $P < .05$

As shown in Table Q, academic (76.2%) and NASA (88.9%) respondents were most likely to use NASA-authored conference/meeting papers.

TABLE Q

Comparison of Usage Rates of NASA-Authored Conference/Meeting Papers by Organizational Affiliation

	Academic		Industrial		Government		NASA		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Use	32	76.2	125	61.6	34	58.6	40	88.9	231	66.4
Non-Use	10	23.8	78	38.4	24	41.4	5	11.1	117	33.6
	42	100.0	203	100.0	58	100.0	45	100.0	348	100.0

Chi-Square is significant at $P < .05$

As shown in Table R, both the academic (81.0%) and NASA (84.4%) respondents were most likely to use NASA-authored journal articles.

TABLE R

Comparison of Usage Rates of NASA-Authored Journal Articles by Organizational Affiliation

	Academic		Industrial		Government		NASA		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Use	34	81.0	127	62.3	40	69.0	38	84.4	239	68.5
Non-Use	8	19.0	77	37.7	18	31.0	7	15.6	110	31.5
	42	100.0	204	100.0	58	100.0	45	100.0	349	100.0

Chi-Square is significant at $P < .05$

TABLE S

Text of Question 15

Do you attend NASA-sponsored conferences and meetings? 1 __Yes 2 __No
(Skip to question 16)

(If YES) How would you rate these conferences and meetings as a source of information for your research?

1 – Very important
2 – Somewhat important
3 – Somewhat unimportant
4 – Very unimportant
5 – No opinion

TABLE T

Summary: Attendance of NASA-Sponsored Conferences and Meetings	Number	Percentage
Yes	179	51.6
No	168	48.4
	347	100.0

As shown in Table T, respondents were fairly evenly divided in terms of their attendance at NASA-sponsored conferences/meetings. Nearly 52 percent attended these conferences/meetings while approximately 48 percent did not. Information from previous NASA STI studies on "conference/meeting" attendance is limited and, due to phrasing of the question, the 1989 results cannot be directly compared. However, Pinelli (1981) did find that approximately 79 percent of those individuals surveyed had attended one or more NASA-sponsored conferences/meetings in the past 3 years.

TABLE U

Summary: NASA-Sponsored Conferences and Meetings as a Source of Information	Number	Percentage
Very important	60	35.3
Somewhat important	93	54.7
Somewhat unimportant	17	10.0
Very unimportant	0	0.0
	170	100.0

For those who had attended NASA-sponsored conferences/meetings, 90 percent (Table U) indicated that these conferences/meetings were important sources of information. Previous NASA STI studies did not address the question of whether NASA-sponsored conferences/meetings were important sources of information.

TABLE V

Text of Question 12

Overall, how would you rate NASA-authored scientific and technical information in terms of "advancing the state-of-the-art" in your discipline?

1 – Very important
2 – Somewhat important
3 – Somewhat unimportant
4 – Very unimportant
5 – No opinion

TABLE W

Summary: Importance of NASA STI in Terms of "Advancing the State-of-the-Art"	Number	Percentage
Very important	104	39.0
Somewhat important	142	53.2
Somewhat unimportant	18	6.7
Very unimportant	3	1.1
	267	100.0

As shown in Table W, approximately 92 percent of the respondents indicated that NASA STI was important in terms of "advancing the state-of-the-art." Approximately 72 and 80 percent, respectively, of the respondents in the Pinelli (1981) study indicated that NASA STI was important to their research and that NASA STI was important in terms of "advancing the state-of-the-art."

Survey Objective 2: The Use and Usefulness of NASA Announcement and Current Awareness Media

To determine the use and usefulness of NASA announcement and current awareness media, respondents were asked two sets of survey questions. First, they were asked to indicate their use of or familiarity with STAR, IAA, SCAN, and RECON. Then, those who used these media were asked to indicate the extent to which they agreed or disagreed with opinion statements concerning these media. (See Table CC, page 28.)

TABLE X

Text of Question 17

Do you use...	Yes, I use it	No, but I'm familiar with it	Never heard of it
STAR, the NASA announcement journal which covers worldwide aerospace technical report literature?	____	____	____
IAA, the NASA announcement journal which covers worldwide aerospace journal literature?	____	____	____
SCAN, the NASA current awareness publication that provides you with a computer listing of new documents announced in STAR and IAA?	____	____	____
RECON, the NASA computerized, on-line interactive system used to search and retrieve NASA scientific and technical information?	____	____	____

Responses regarding the use of STAR, IAA, SCAN, and RECON are found in Table Y which appears on page 25.

TABLE Y

Summary: Use of NASA Announcement and Current Awareness Media

	Yes, I use it		No, but I'm familiar with it		Never heard of it		Total	
	No.	%	No.	%	No.	%	No.	%
STAR, the NASA announcement journal which covers worldwide aerospace technical report literature	108	31.4	123	35.8	113	32.8	344	100
IAA, the NASA announcement journal which covers worldwide aerospace journal literature	26	7.7	97	28.7	215	63.6	338	100
SCAN, the NASA current awareness publication that provides you with a computer listing of new documents announced in STAR and IAA	44	13.0	93	27.5	201	59.5	338	100
RECON, the NASA computerized, on-line interactive system used to search and retrieve NASA scientific and technical information	38	11.2	71	20.9	231	67.9	340	100

As shown in Table Y, the overall use rate for the four media was low. Approximately 31 percent used STAR, 13 percent used SCAN, just over 11 percent used RECON, and nearly 8 percent used IAA. Correspondingly, the percentage who had never heard

of these four media was high. Almost 68 percent of the respondents indicated that they had "never heard of..." RECON followed by approximately 64 percent for IAA. Nearly 60 percent had "never heard of..." SCAN, while only 32.8 percent were unaware of STAR.

Previous NASA STI studies indicated that use of NASA announcement and current awareness media varied, with NASA personnel using these media more than non-NASA personnel. These relationships are also true for this (1989) study.

Cross tabulations were used to compare respondents' "organizational" affiliations with their use of the four NASA media. As shown in Table Z, academic (42.9%) and NASA (62.2%) respondents were most likely to use STAR than were government (24.6%) and industry (24.2%) respondents.

TABLE Z

Comparison of Usage Rates of STAR by Organizational Affiliation

	Academic		Industrial		Government		NASA		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes, I use it	18	42.9	48	24.2	14	24.6	28	62.2	108	31.6
No, but I'm familiar with it	9	21.4	79	39.9	22	38.6	13	28.9	123	36.0
Never heard of it	15	35.7	71	35.9	21	36.8	4	8.9	111	32.5
	42	100.0	198	100.0	57	100.0	45	100.0	342	100.0

Chi-Square is significant at $P < .05$

As shown in Table AA, academic (19.0%) and NASA (22.7%) respondents were somewhat more likely to use SCAN than were industrial (9.8%) and government (12.3%) respondents.

TABLE AA

Comparison of Usage Rates of SCAN by Organizational Affiliation

	Academic		Industrial		Government		NASA		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes, I use it	8	19.1	19	9.8	7	12.3	10	22.7	44	13.1
No, but I'm familiar with it	10	23.8	53	27.5	11	19.3	19	43.2	93	27.7
Never heard of it	24	57.1	121	62.7	39	68.4	15	34.1	199	59.2
	42	100.0	193	100.0	57	100.0	44	100.0	336	100.0

Chi-Square is significant at P < .05

As shown in Table BB, NASA respondents (52.3%) were much more likely to use RECON than any other type of respondents.

TABLE BB

Comparison of Usage Rates of RECON by Organizational Affiliation

	Academic		Industrial		Government		NASA		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Yes, I use it	3	7.2	10	5.2	2	3.4	23	52.2	38	11.2
No, but I'm familiar with it	9	21.4	40	20.6	10	17.3	12	27.3	71	21.0
Never heard of it	30	71.4	144	74.2	46	79.3	9	20.5	229	67.8
	42	100.0	194	100.0	58	100.0	44	100.0	338	100.0

Chi-Square is significant at P < .05

TABLE CC

Text of Question 18

Next, we'd like to ask your opinion of NASA's bibliographic tools. Please indicate how strongly you agree or disagree with each of the following statements.

About STAR:	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
The coverage is adequate for my research	___	___	___	___	___
The category scheme is adequate	___	___	___	___	___
The announcements are current enough	___	___	___	___	___
The abstracts are adequate for my research	___	___	___	___	___
About IAA:					
The coverage is adequate for my research	___	___	___	___	___
The category scheme is adequate	___	___	___	___	___
The announcements are current enough	___	___	___	___	___
The abstracts are adequate for my research	___	___	___	___	___
About SCAN:					
The announcements in SCAN are current enough	___	___	___	___	___
SCAN is easy to use	___	___	___	___	___
The print quality of SCAN improves its usefulness	___	___	___	___	___
About RECON:					
The coverage is adequate for my research	___	___	___	___	___
RECON is easy to use	___	___	___	___	___
The RECON database is current enough	___	___	___	___	___
Searches of the RECON database meet my research requirements	___	___	___	___	___

TABLE DD

Summary: NASA Bibliographic Tools--STAR										
About STAR:	Strongly Agree		Agree		Disagree		Strongly Disagree		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
The coverage is adequate for my research	28	17.9	107	68.6	20	12.8	1	0.7	156	100
The category scheme is adequate	27	17.8	106	69.7	17	11.2	2	1.3	152	100
The announcements are current enough	19	12.7	111	74.0	13	8.7	7	4.6	150	100
The abstracts are adequate for my research	23	15.0	110	71.9	16	10.5	4	2.6	153	100

Note: The "don't know" responses were excluded from Tables DD, EE, FF, and GG. Only people familiar with these bibliographic tools have been included.

As shown in Table DD, approximately 87 percent of the respondents who were familiar with STAR indicated that the coverage of STAR was adequate for their research. Nearly 88 percent of them indicated that the category scheme of STAR was adequate, while almost 87 percent indicated that the announcements in STAR were current enough. Also, nearly 87 percent indicated that the abstracts were adequate for their research.

TABLE EE

Summary: NASA Bibliographic Tools--IAA										
About IAA:	Strongly Agree		Agree		Disagree		Strongly Disagree		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
The coverage is adequate for my research	13	24.1	31	57.4	9	16.7	1	1.8	54	100
The category scheme is adequate	11	21.2	35	67.3	6	11.5	0	0.0	52	100
The announcements are current enough	10	18.9	35	66.0	7	13.2	1	1.9	53	100
The abstracts are adequate for my research	12	22.2	36	66.7	5	9.3	1	1.8	54	100

As shown in Table EE, approximately 81 percent of these respondents indicated that the coverage of IAA was adequate for their research, while nearly 89 percent rated the category scheme of IAA as adequate. About 85 percent indicated that the announcements in IAA were current enough and almost 89 percent indicated that the abstracts in IAA were adequate for their research.

TABLE FF

Summary: NASA Bibliographic Tools--SCAN

About SCAN:	Strongly Agree		Agree		Disagree		Strongly Disagree		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
The announcements in SCAN are current enough	8	12.5	45	70.3	11	17.2	0	0.0	64	100
SCAN is easy to use	11	18.1	35	57.4	14	23.0	1	1.7	61	100
The print quality of SCAN improves its usefulness	8	13.5	42	71.2	9	15.3	0	0.0	59	100

As shown in Table FF, approximately 83 percent of the respondents who were familiar with SCAN indicated that the announcements in SCAN were current enough and over 75 percent thought that SCAN was easy to use. Nearly 85 percent of these respondents indicated that the print quality of SCAN improves its usefulness.

TABLE GG

Summary: NASA Bibliographic Tools--RECON

About RECON:	Strongly Agree		Agree		Disagree		Strongly Disagree		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
The coverage is adequate for my research	8	15.4	37	71.2	6	11.5	1	1.9	52	100
RECON is easy to use	4	8.3	33	68.8	8	16.6	3	6.2	48	100
The RECON database is current enough	4	8.3	32	66.7	10	20.8	2	4.2	48	100
Searches of the RECON database meet my research requirements	8	16.7	27	56.2	11	22.9	2	4.1	48	100

As shown in Table GG, over 86 percent of the respondents familiar with RECON indicated that the coverage of RECON was adequate for their research. Approximately 77 percent of them indicated that RECON was easy to use. Seventy-five percent indicated that the RECON database was current enough and 73 percent indicated that RECON searches met their research requirements.

Both the Drobka study (1973) and the Burr study (1978) included questions regarding STAR, IAA, SCAN, and RECON. Although the questions were similar to those used in this study, the sample frames for both Drobka and Burr included only NASA engineers and scientists. Given that NASA personnel are most likely to use STAR, IAA, SCAN, and RECON, comparing the data from these studies with the data from this (1989) study could be misleading.

The "use" and "unfamiliar with" responses from the Pinelli (1981) study of non-NASA personnel were compared with the "use" and "never heard of it" responses from this study (1989) and appear below.

USE OF AND FAMILIARITY WITH NASA ANNOUNCEMENT AND CURRENT AWARENESS MEDIA BY NON-NASA PERSONNEL

(All Values Are Percentages)

Media	Use		Unfamiliar With/ Never Heard of it	
	1981	1989	1981	1989
STAR	66 n=381	27 n=297	27 n=381	36 n=297
IAA	48 n=381	6 n=292	42 n=381	68 n=292
SCAN	33 n=381	12 n=292	54 n=381	63 n=292
RECON	52 n=381	5 n=294	29 n=381	75 n=294

The two data sets are comparable in that both groups were composed of non-NASA personnel; however, differences in sample design and frame limit the extent to which comparisons can be made. However, to the extent that comparisons of the data are

valid, it appears that use of STAR, IAA, SCAN, and RECON by non-NASA personnel has decreased from 1981 to 1989 as has their familiarity with these four media.

Survey Objective 3: How NASA Technical Reports Are Obtained and Reaction to Changes in NASA Technical Reports

Six questions were used to determine how NASA technical reports are obtained and the reaction of respondents to changes in NASA reports. As shown in Table N, page 19, approximately 22 percent of the 353 respondents indicated "non" use of NASA technical reports. These 79 respondents were then asked to indicate why they did not use NASA technical reports.

TABLE HH

Text of Question 8

Why don't you use NASA technical reports?
(Circle choice then skip to question 15)

1 – Not available/accessible
2 – Not relevant to my research
3 – Not used in my discipline
4 – Not reliable/accurate
5 – Not timely/current
6 – Other _____

TABLE II

Summary: NASA Reports--Reasons For Non-Use	Number	Percentage
Not available/accessible	28	35.4
Not relevant to my research	23	29.1
Not used in my discipline	13	16.5
Not reliable/accurate	1	1.3
Not timely/current	2	2.5
Other	12	15.2
	79	100.0

Approximately 35 percent of the respondents (Table II) gave "not available/ accessible" as their reason for not using NASA technical reports. Another 29 percent indicated that NASA technical reports were not relevant to their research. Almost 17 percent indicated that NASA technical reports were not used in their discipline, while only about 4 percent found them to be not reliable/accurate and not timely/current.

The 77.6 percent of the respondents (see Table N) who used NASA technical reports were asked to indicate how they usually find out about NASA technical reports.

TABLE JJ

Text of Question 9

(If YES to question 8) How do you usually find out about NASA technical reports?

1 – Bibliographic search
2 – Announcement journal (e.g., STAR)
3 – Current awareness publication (e.g., SCAN)
4 – Cited in report or journal
5 – Referred by colleague
6 – Routed to me
7 – Other _____

As shown in Table KK, page 34, approximately 24 percent of the respondents who use NASA technical reports found out about them through citations in reports and journals, while another 23 percent found out about NASA technical reports through bibliographic searches. Approximately 15 percent found out about NASA technical reports through such announcement media as STAR while 14 percent found out from colleagues. Nearly 11 percent indicated "routed to me" while 8 percent indicated the use of a current awareness publication such as SCAN was how they found out about NASA technical reports.

TABLE KK

Summary: NASA Technical Reports--How Found	Number	Percentage
Bibliographic search	63	23.2
Announcement journal (e.g., STAR)	41	15.1
Current awareness publication (e.g., SCAN)	22	8.1
Cited in report or journal	66	24.3
Referred by colleague	38	14.0
Routed to me	29	10.7
Other	13	4.6
	272	100.0

Monge (1979) asked aerospace researchers to indicate "the major way they learned about new NASA publications." Listed below in rank order are the sources indicated by the respondents.

Source	Percentage
Newsletters	30
STAR index	21
NASA contacts	15
Reading journal	15
Colleague inside company	12
NASA technical brief/SCAN	4
Colleague outside company	2
No response	1

The responses to question 9 of this study (1989) were compared to the responses to the question in the Monge study (1979). The comparison appears below.

Present Study (1989)		Monge Study (1979)	
Source	Percentage	Source	Percentage
Cited in report or journal	24	Newsletter prepared by library	30
Bibliographic search	23	STAR Index	21
Announcement journal (e.g., STAR)	15	NASA contacts	15
Referred by colleague	14	Reading journal	15
Routed to me	11	Colleague inside company	12

In reviewing the lists from both studies, it appears that both formal (i.e., written) and informal (i.e., colleagues) information sources play important roles in how researchers "find out about" NASA technical reports. Considering both lists, it appears that formal information sources are used more than informal information sources to find out about NASA technical reports. The previously cited engineering STI studies found that engineers tend to use informal information sources before using formal information sources.

TABLE LL

Text of Question 10

How do you usually obtain physical access to NASA technical reports?

1 - NASA distributes them to be
2 - NASA sends them to my library/organization
3 - Author sends it to me
4 - I request that the author send it to me
5 - My library/organization requests it for me
6 - Other _____

TABLE MM

Summary: NASA Technical Reports--How Obtained	Number	Percentage
NASA distributes them to me	29	10.5
NASA sends them to my library/organization	81	29.7
Author sends them to me	16	5.9
I request that the author send them to me	16	5.9
My library/organization requests them for me	125	45.8
Other	6	2.2
	273	100.0

As shown in Table MM, approximately 46 percent of the respondents who use NASA technical reports indicated that their library/information service was responsible for physically obtaining the report once the respondents became aware of them. Further, approximately 30 percent of them indicated that NASA technical reports were sent to their organization's library or information service. These data suggest that the library/information service plays a crucial role in disseminating NASA technical reports.

TABLE NN

Text of Question 11

How do you usually use NASA technical reports?

1 - Apply findings to current project
2 - Apply methodology to current projects
3 - To prepare a research proposal
4 - To prepare a conference paper/journal article/technical report
5 - As a citation in a conference paper/journal article/technical report
6 - Personal/professional development
7 - To prepare a lecture/presentation
8 - To plan, budget, or manage research

TABLE 00

Summary: NASA Technical Reports--How Used	Number	Percentage
Apply findings to current project (s)	114	41.9
Apply methodology to current projects (s)	61	22.5
To prepare a research proposal	10	3.7
To prepare a conference paper/ journal article/technical report	14	5.1
As a citation in a conference paper/ journal article/technical report	14	5.1
Personal/professional development	44	16.2
To prepare a lecture/presentation	2	0.7
To plan, budget, or manage research	13	4.8
	272	100.0

Respondents who use NASA technical reports were asked to indicate how they "usually" use NASA technical reports. The responses, which appear in Table 00, show that NASA technical reports serve three general purposes -- education/professional development, research, and management. Approximately 64 percent indicated that NASA technical reports were used for research purposes, while about 16 percent indicated that NASA technical reports were used for education/professional development.

Few studies have focused on U.S. government technical reports. McClure (1988) states that of the technical report studies conducted, "it is often unclear whether U.S. government technical reports, non-government technical reports, or both were included." King (1982) conducted a study designed to determine the value of the Department of Energy database. Roderer (1983) conducted a similar study to determine the use and value of Defense Technical Information Center products and services. Both studies included questions on the "use" of government technical reports. A comparison of data from this study (1989) with data from the King and Roderer studies on government technical report use appears on page 38.

A comparison of the data from the King and Roderer studies indicates very similar patterns for the use of Department of Defense (57%) and Department of Energy (58%) technical reports which are used primarily for research. To a lesser extent they are used for educational purposes, 32 and 31 percent respectively, and for management, 9 and 11 percent respectively. NASA technical reports, by comparison, were used to a greater extent for research (78 percent), followed by educational with 17 percent, and only 5 percent being used for management.

USE OF GOVERNMENT TECHNICAL REPORTS BY ENGINEERS AND SCIENTISTS

	NASA		Department of Defense		Department of Energy	
	Number	Percentage	Number	Percentage	Number	Percentage
Educational						
Self -- For professional development, current awareness, or general interest	44		74		75	
Others -- In preparation of a lecture of presentation	2		39		40	
	46	17	113	32	115	31
Research						
In preparation of a research proposal	10		27		38	
To apply its findings to a current project	114		75		77	
To apply its methodology to a current project	61		53		50	
In preparation of an article, book, review, or report	14		--		--	
As a citation in an article, book, review, or report	14		50		48	
	213	78	205	57	213	58
Management						
For the planning, budgeting, and management of research	13		33		40	
	13	5	33	9	40	11
Other	--		6		--	
			6	2		
	272	100	357	100	369	100

The questionnaire included three questions designed to determine the likelihood of aeronautical engineers and scientists using, in electronic format, information products that are typically prepared in printed format.

TABLE PP

Text of Question 13

Extensive data tabulations, mathematical presentations, and lengthy computer programs are usually printed in the Appendix of NASA technical reports. How likely would you be to use this information if it were provided in electronic format (e.g., floppy disk) rather than the printed form? (Circle one choice in each column)

Data Tables/Mathematical Presentations

1 - Very likely
2 - Somewhat likely
3 - Somewhat unlikely
4 - Very unlikely

Computer Program Listings

1 - Very likely
2 - Somewhat likely
3 - Somewhat unlikely
4 - Very unlikely

TABLE QQ

Summary: NASA Technical Reports--Use of Data Tables/Mathematical Presentations in Electronic Format	Number	Percentage
Very likely	64	23.5
Somewhat likely	105	38.6
Somewhat unlikely	61	22.4
Very unlikely	42	15.5
	272	100.0

As shown in Table QQ, approximately 62 percent of the respondents who use NASA technical reports were likely to use data tables/mathematical presentations in electronic format while 38 percent indicated that they were unlikely to do so. The relatively high percent of respondents indicating an interest in using tables/mathematical presentations in electronic format compares favorably with Shuchman's (1981) findings regarding the use of computer and information technology by aeronautical engineers.

TABLE RR

Summary: NASA Technical Reports--Use of Computer Program Listings in Electronic Format	Number	Percentage
Very likely	98	37.8
Somewhat likely	83	32.0
Somewhat unlikely	46	17.8
Very unlikely	32	12.4
	259	100.0

As shown in Table RR, approximately 70 percent of the respondents were likely to use computer program listings in electronic format while 30 percent indicated that they were unlikely to do so. These findings also compare favorably with Shuchman's (1981) findings regarding the use of computer and information technology by aeronautical engineers.

Cross tabulations were used to compare respondents' "organizational" affiliation with their likelihood of using data tables/mathematical presentations and computer program listings in electronic format. As shown in Table SS, NASA respondents were more likely to use computer program listings in electronic format than were their counterparts in academia, industry, and government.

TABLE SS

Comparison of Usage Rates of Computer Program Listings in Electronic Format by Organizational Affiliation

	Academic		Industrial		Government		NASA		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Likely to Use	21	72.5	106	70.7	24	60.0	29	74.4	180	69.8
Unlikely to Use	8	27.5	44	29.3	16	40.0	10	25.6	78	30.2
	29	100.0	150	100.0	40	100.0	39	100.0	258	100.0

Chi-Square is significant at $P < .05$

RECON, the NASA computerized on-line interactive system, is used to search the NASA STI database. A RECON search essentially provides a bibliographic record of a particular document in the database and includes such information as author, title, date of publication, and availability of the document. Included with the record is an abstract of the document. Respondents were asked to indicate their "likelihood" of using a computerized on-line system that would provide the full text, including graphics, of NASA technical reports. The text of the question appears in Table TT.

TABLE TT

Text of Question 14

NASA technical reports come in both paper and microfiche format. How likely would you be to use a computerized, on-line system (with full text and graphics) for NASA technical reports?

1 – Very likely 2 – Somewhat likely 3 – Somewhat unlikely 4 – Very unlikely

TABLE UU

Summary: NASA Technical Reports--Use of Computerized, On-Line System	Number	Percentage
Very likely	73	26.8
Somewhat likely	100	36.8
Somewhat unlikely	62	22.8
Very unlikely	37	13.6
	272	100.0

As shown in Table UU, almost 64 percent of the respondents who use NASA technical reports indicated some likelihood of using a computerized on-line system with full text capability for NASA technical reports. Approximately 36 percent of the respondents indicated they were "unlikely" to use such a system. The responses to this question compared favorably with the previous two questions relating to use of an information product in an electronic format.

Survey Objective 4: The Quality (Prestige) of NASA-Authored Journal Articles and Technical Reports -- the Organization (Format), Adequacy and Accuracy of Data, and the Quality of Visual Presentations in NASA Technical Reports

Assessing the quality of STI is a much debated topic. Just as there is no generally agreed upon standard for measuring the return from federally funded research, there is no generally agreed upon standard for measuring the quality of technical reports. This is not to say that certain dimensions of technical report production such as readability/comprehension cannot be measured or assessed. In the final analysis, however, most attempts to assess the quality of STI tend to be subjective in nature.

The questions included in the survey relative to the quality of NASA-authored journal articles and technical reports (see Table VV) are subjective in that the users of these information products were asked to rate the quality of these products as excellent, good, fair, or poor.

TABLE VV

Text of Question 16

We would like to know your opinion of NASA-authored scientific and technical information. (If you do not use NASA-authored information, skip to question 17)

How would you rate:	Excellent	Good	Fair	Poor	No opinion
The quality of their journal articles	____	____	____	____	____
The quality of their technical reports	____	____	____	____	____
The precision/accuracy of the data in their technical reports	____	____	____	____	____
The adequacy of the data and the documentation in their technical reports	____	____	____	____	____
The organization/format of their technical reports	____	____	____	____	____
The quality of the graphics (i.e., charts, figures, photos) in NASA-authored technical reports	____	____	____	____	____

TABLE WW

Summary: Perceived Quality of NASA-Authored Journal Articles and Technical Reports

	Excellent		Good		Fair		Poor		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
The quality of their journal articles	61	22.9	177	66.5	25	9.5	3	1.1	266	100
The quality of their technical reports	75	26.7	173	61.6	30	10.6	3	1.1	281	100

As shown in Table WW, the overall perception of the quality of NASA-authored journal articles and technical reports is high. Approximately 89 percent of the respondents indicated that the quality of NASA-authored journal articles was either excellent (23 percent) or good (66 percent). Over 88 percent of the respondents

indicated that the quality of NASA-authored technical reports was excellent (27 percent) or good (61 percent). Only 11 percent and 12 percent, respectively, of the respondents indicated that the quality of NASA-authored journal articles and technical reports ranged between fair and poor.

Respondents were also asked to rate the quality of NASA-authored technical reports on four dimensions -- organization/format, precision/accuracy of data, adequacy of data, and the quality of the visual presentations.

TABLE XX

Summary: Perceived Organization (Format), Precision/Accuracy of Data, Adequacy of Data, and Quality of the Graphics in NASA-Authored Technical Reports

	Excellent		Good		Fair		Poor		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
The organization/format of their technical reports	61	21.9	156	56.1	55	19.8	6	2.2	278	100
The precision/accuracy of the data in their technical reports	88	33.6	147	56.1	25	9.5	2	0.8	262	100
The adequacy of the data in their technical reports	55	20.0	160	58.2	52	18.9	8	2.9	275	100
The quality of the graphics (i.e. charts, figures, photos) in NASA-authored technical reports	74	26.6	142	51.1	57	20.5	5	1.8	278	100

As shown in Table XX, approximately 78 percent of the respondents indicated that the organization/format of NASA-authored technical reports was either excellent (22 percent) or good (56 percent). Conversely, 22 percent indicated that the organization/format of NASA-authored technical reports was fair (20 percent) or poor (2 percent).

Almost 90 percent of the respondents indicated that the precision/accuracy of the data in NASA-authored technical reports was excellent (34 percent) or good (56 percent). Conversely, 10 percent of the respondents indicated that the precision/accuracy of the data in NASA-authored technical reports was fair (9 percent) or poor (1 percent).

Approximately 78 percent of the respondents indicated that the adequacy of data in NASA-authored technical reports was excellent (20 percent) or good (58 percent). Only 22 percent of the respondents indicated that the adequacy of data in NASA-authored technical reports was fair (19 percent) or poor (3 percent).

Finally, 78 percent of the respondents indicated that the quality of graphics in NASA-authored technical reports was excellent (27 percent) or good (51 percent). Conversely, 22 percent of the respondents indicated that the quality of graphics in NASA-authored technical reports was fair (20 percent) or poor (2 percent).

CONCLUDING REMARKS

A pilot study was undertaken to gather baseline data regarding the use and perceived usefulness of selected NASA STI products and to develop/validate questions that could be used in a future study concerned with the role of the U.S. government technical report in aeronautics. Given this limited purpose -- the low response rate, which is fairly typical for mail surveys, and the limitations associated with "user" studies -- no claims are made regarding the extent to which the attributes of the respondents of this study accurately reflect the attributes of the "non-respondents" or the attributes of the population being studied. A much more rigorous research design and methodology would be needed before such claims could be made.

Nevertheless, the findings of this (1989) study, coupled with the results of previous NASA and engineering STI studies, do permit the formulation of certain general statements regarding the use and usefulness of NASA STI products.

1. Engineers and scientists are ardent consumers of STI. This statement is no less true for those engineers and scientists who participated in previous NASA STI studies and those aeronautical engineers and scientists who participated in this (1989) study.

2. NASA STI is used and is generally perceived as being important in terms of "advancing the state-of-the-art" by the aeronautical engineers and scientists who participated in this study.

3. The use rate for NASA STI products is fairly consistent with NASA technical reports enjoying the highest use rate (77.6) followed by NASA-authored journal articles (68.7 percent) and NASA-authored conference/meeting papers (66.6 percent).

4. Of those aeronautical engineers and scientists who attended NASA-sponsored conferences and meetings (51.6 percent), 90 percent indicated that these conferences/meetings are important sources of information.

5. Overall, the use rate for the NASA announcement and current awareness media is low; the number of aeronautical engineers and scientists who are unfamiliar with the NASA announcement and current awareness media is high; and a considerable number of aeronautical engineers and scientists who are familiar with the NASA announcement and current awareness media do not use them.

6. Overall, those aeronautical engineers and scientists who are familiar with the NASA announcement and current awareness media find them to be easy to use, the announcement/database current, the scope and coverage adequate, the category scheme adequate, and that RECON searches meet the users requirements.

7. While NASA technical reports enjoyed the highest use rate in this study, approximately 36 percent of the "non-users" indicated that these reports are not available/accessible followed by 29 percent who indicated that these reports are not relevant to their research.

8. Approximately 48 percent of the aeronautical engineers and scientists in this study who use NASA technical reports found out about them through citations in technical reports and journal articles and by searches of bibliographic databases.

9. Approximately 75 percent of the aeronautical engineers and scientists in this study obtain NASA technical reports from or through their libraries.

10. Approximately 78 percent of the aeronautical engineers and scientists in this study who use NASA technical reports use them for research purposes.

11. Approximately 62 and 70 percent, respectively, of the aeronautical engineers and scientists in this study who use NASA technical reports are likely to use data tables/mathematical presentations and computer program listings in electronic format.

12. The aeronautical engineers and scientists in this study who use NASA STI perceive the quality of NASA-authored journal articles and technical reports to be very good.

13. The aeronautical engineers and scientists in this study who use them perceive the four quality attributes of NASA-authored technical reports -- format/organization, adequacy of data, accuracy of data, and quality of visual presentations -- to be very good.

With respect to the development/validation of questions that could be used in a future study, the following observations are made.

1. It might be useful to determine if the use and usefulness of NASA STI differ in terms of such structural and institutional variables as education, academic preparation, type of organization, professional duties, and technical discipline.

2. It might be helpful to determine why those aeronautical engineers and scientists who are familiar with the NASA announcement and current awareness media do not use them.

3. It might be helpful to determine the use and familiarity of other NASA announcement and current awareness media such as the "Aeronautical Engineering Continuing Bibliography."

4. It might be helpful to determine if aeronautical engineers and scientists are likely to use STAR, IAA, and SCAN in electronic format.

5. It might be helpful to determine why and the extent to which NASA technical reports are not accessible, relevant, and used.

6. It might be helpful to determine why the perceived quality of NASA-authored journal articles and technical reports is "good" and not "excellent."

7. It might be helpful to determine why the adequacy of data and accuracy of data in NASA-authored technical reports is perceived as "good" and not "excellent."

8. It might be helpful to determine why some aeronautical engineers and scientists do not attend NASA-sponsored conferences and meetings.

9. While the overall quality of NASA technical reports is perceived as being very good, it might be helpful to determine the extent to which the perception of quality varies within the NASA technical report series.

10. "Practicing" aeronautical engineers and scientists were the focus of this study. It might be helpful to determine the perceptions of undergraduate and graduate aeronautical engineering and science students and to compare their perceptions with those of "practicing" aeronautical engineers and scientists.

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APPENDIX A

SURVEY INSTRUMENT

TECHNICAL INFORMATION OPINION SURVEY

Which of the following sources of information do you use in your research?

1. __Yes __ No Conference/meeting papers
2. __Yes __ No Academic technical reports
3. __Yes __ No Technical reports from industry
4. __Yes __ No Journal articles
5. __Yes __ No Government technical reports (Non-NASA)
6. __Yes __ No NASA-authored conference/meeting papers
7. __Yes __ No NASA-authored journal articles
8. __Yes (1) __ No (2) NASA technical reports ... if NO...Why don't you use NASA technical reports? **(Circle choice then skip to question 15)**

   1 — Not available/accessible
   2 — Not relevant to my research
   3 — Not used in my discipline
   4 — Not reliable/accurate
   5 — Not timely/current
   6 — Other _____

9. **(If YES to question 8) How do you *usually* find out about NASA technical reports? (Circle choice)**

   1 — Bibliographic search
   2 — Announcement journal (e.g. STAR)
   3 — Current awareness publication (e.g. SCAN)
   4 — Cited in report or journal
   5 — Referred by colleague
   6 — Routed to me
   7 — Other _____

10. **How do you *usually* obtain physical access to NASA technical reports? (Circle choice)**

    1 — NASA distributes them to me
    2 — NASA sends them to my library/organization
    3 — Author sends it to me
    4 — I request that the author send it to me
    5 — My library/organization requests it for me
    6 — Other _____

11. **How do you *usually* use NASA technical reports (Circle choice)**

    1 — Apply findings to current project
    2 — Apply methodology to current projects
    3 — To prepare a research proposal
    4 — To prepare a conference paper/journal article/technical report
    5 — As a citation in a conference paper/journal article/technical report
    6 — Personal/professional development
    7 — To prepare a lecture/presentation
    8 — To plan, budget, or manage research

12. **Overall, how would you rate NASA-authorized scientific and technical information in terms of "advancing the state-of-the-art" in your discipline?**

    1 — Very important
    2 — Somewhat important
    3 — Somewhat unimportant
    4 — Very unimportant
    5 — No opinion

13. **Extensive data tabulations, mathematical presentations, and lengthy computer programs are usually printed in the Appendix of NASA technical reports. How likely would you be to use this information if it were provided in electronic format (e.g. floppy disk) rather than the printed form? (Circle one choice in each column)**

Data Tables/Mathematical Presentations	Computer Programs Listings
1 — Very likely	1 — Very likely
2 — Somewhat likely	2 — Somewhat likely
3 — Somewhat unlikely	3 — Somewhat unlikely
4 — Very unlikely	4 — Very unlikely

14. **NASA technical reports come in both paper and microfiche format. How likely would you be to use a *computerized, on-line system* (with full text and graphics) for NASA technical reports?**

1 — Very likely 2 — Somewhat likely 3 — Somewhat unlikely 4 — Very unlikely

15. **Do you attend NASA-sponsored conferences and meetings?** 1 — Yes 2 — No (Skip to question 16)

(If YES) How would you rate these conferences and meetings as a source of information for your research?

1 — Very important
2 — Somewhat important
3 — Somewhat unimportant
4 — Very unimportant
5 — No opinion

17

16. **We would like to know your opinion of *NASA-authored* scientific and technical information.** (If you do not use NASA-authored information, skip to question 17)

How would you rate:	Excellent	Good	Fair	Poor	No opinion
The quality of their journal articles	____	____	____	____	____
The quality of their technical reports	____	____	____	____	____
The precision/accuracy of the data in their technical reports	____	____	____	____	____
The adequacy of the data and the documentation in their technical reports	____	____	____	____	____
The organization/format of their technical reports	____	____	____	____	____
The quality of the graphics (i.e. charts, figures, photos) in NASA-authored technical reports	____ 1	____ 2	____ 3	____ 4	____ 5

17. **Do you use...**

	Yes, I use it	No, but I'm familiar with it	Never heard of it
STAR, the NASA announcement journal which covers worldwide aerospace technical report literature?	____	____	____
IAA, the NASA announcement journal which covers worldwide aerospace journal literature?	____	____	____
SCAN, the NASA current awareness publication that provides you with a computer listing of new documents announced in STAR and IAA?	____	____	____
RECON, the NASA computerized, on-line interactive system used to search and retrieve NASA scientific and technical information?	____ 1	____ 2	____ 3

18. **Next, we'd like to ask your opinion of NASA's bibliographic tools. Please indicate how strongly you *agree* or *disagree* with each of the following statements.**

About STAR:	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
The coverage is adequate for my research	—	—	—	—	—
The category scheme is adequate	—	—	—	—	—
The announcements are current enough	—	—	—	—	—
The abstracts are adequate for my research	—	—	—	—	—
About IAA:					
The coverage is adequate for my research	—	—	—	—	—
The category scheme is adequate	—	—	—	—	—
The announcements are current enough	—	—	—	—	—
The abstracts are adequate for my research	—	—	—	—	—
About SCAN:					
The announcements in SCAN are current enough	—	—	—	—	—
SCAN is easy to use	—	—	—	—	—
The print quality of SCAN improves its usefulness	—	—	—	—	—
About RECON:					
The coverage is adequate for my research	—	—	—	—	—
RECON is easy to use	—	—	—	—	—
The RECON database is current enough	—	—	—	—	—
Searches of the RECON database meet my research requirements	1	2	3	4	5

19. **What are your present professional duties?**

1 — Research
2 — Administration/Mgt.
3 — Design/Development
4 — Teaching/Academic
5 — Manufacturing/Production
6 — Private Consultant
7 — Service/Maintenance
8 — Marketing/Sales
9 — Other _____ 43

20. **Type of organization where you work:**

1 — Academic
2 — Industrial
3 — Not-for-profit
4 — Government (Non-NASA)
5 — NASA
6 — Other _____

21. **How many years of professional work experience do you have?** _____ years

22. **What is your AIAA interest group?**

1 — Aerospace Science
2 — Aircraft Systems
3 — Structures, Design and Test
4 — Propulsion and Energy
5 — Aerospace and Information Systems
6 — Administration/Management
7 — Other _____

23. **What is your level of education?**

1 — No degree
2 — Bachelors
3 — Masters
4 — Doctorate
5 — Other _____

24. **What is your gender?** 1 — Male 2 — Female

(more on back pg.)

COMMENTS AND/OR SUGGESTIONS

1. Are there any comments you can offer about the topics covered in this survey?

2. What suggestions do you have for making the results of NASA research more accessible/available to you?

Please mail to: Dr. Myron Glassman
Department of Marketing
Old Dominion University
Norfolk, Virginia 23529-0218

APPENDIX B

USE AND USEFULNESS OF NASA ANNOUNCEMENT AND CURRENT AWARENESS MEDIA

The Drobka Study

Survey results were based on structured interviews with 114 engineers and scientists at 10 NASA locations and 3 contractor facilities who used the form media.

(All Values are Percentages)

	Use It	Easy To Use	Scope and Coverage Adequate	Category Scheme Adequate	Announcements/ Data Base Current	Abstracts Adequate	Searches Met Users Requirements
STAR	67	81	67	77	75	88	n/a
IAA	56	81	53	75	75	85	n/a
SCAN	51	*	+	+	+	n/a	n/a
RECON	52	*	+	n/a	+	+	72

* - data missing + - question not included n/a - not applicable

The Burr Study

Structured interviews with 76 engineers and scientists at 7 NASA installations who used the form media.

(All Values are Percentages)

	Use It	Easy To Use	Scope and Coverage Adequate	Category Scheme Adequate	Announcements/ Data Base Current	Abstracts Adequate	Searches Met Users Requirements
STAR	45	97	79	85	76	94	n/a
IAA	34	100	85	88	85	96	n/a
SCAN	45	84	n/a	n/a	69	n/a	n/a
RECON	79	85	61	67	73	n/a	67

n/a - not applicable

APPENDIX B

The Pinelli Studies

Self-administered questionnaires received from 300 NASA LaRC engineers (1980) and scientists and 381 non-NASA LaRC engineers and scientists (1981).

(All Values are Percentages)

	NASA LaRC engineers and scientists				Non-NASA LaRC engineers and scientists			
	Use	Never Use	Unfamiliar With	Total	Use	Never Use	Unfamiliar With	Total
STAR	84	8	8	100	66	7	27	100
IAA	76	12	12	100	48	10	42	100
SCAN	49	21	30	100	33	13	54	100
RECON	69	13	18	100	52	19	29	100
	n=300				n=381			

APPENDIX C

AGGREGATE TOTALS

TECHNICAL INFORMATION OPINION SURVEY

(Percentages)

Which of the following sources of information do you use in your research?

5	v1	1.	84 Yes	16 No	Conference/meeting papers
6	v2	2.	56 Yes	43 No	Academic technical reports
7	v3	3.	76 Yes	24 No	Technical reports from industry
8	v4	4.	86 Yes	14 No	Journal articles
9	v5	5.	70 Yes	30 No	Government technical reports (Non-NASA)
10	v6	6.	66 Yes	34 No	NASA-authored conference/meeting papers
11	v7	7.	69 Yes	31 No	NASA-authored journal articles
12	v8	8.	78 Yes	22 No	NASA technical reports ... if NO...Why don't you use NASA technical reports? (Circle choice then skip to question 15)

0 = Blank

v9	1	8	Not available/accessible
	2	7	Not relevant to my research
13	3	4	Not used in my discipline
	4	1	Not reliable/accurate
	5	1	Not timely/current
	6	12	Other _____ Skip 79

0 = Blank
9 = Skip

9. **(If YES to question 8) How do you *usually* find out about NASA technical reports? (Circle choice)**

v10	1	18	Bibliographic search
	2	12	Announcement journal (e.g. STAR)
	3	6	Current awareness publication (e.g. SCAN)
14	4	19	Cited in report or journal
	5	11	Referred by colleague
	6	8	Routed to me
	7	4	Other _____ Skip 22

0 = Blank
9 = Skip

10. **How do you *usually* obtain physical access to NASA technical reports? (Circle choice)**

v11	1	8	NASA distributes them to me
	2	23	NASA sends them to my library/organization
	3	5	Author sends it to me
15	4	5	I request that the author send it to me
	5	34	My library/organization requests it for me
	6	2	Other _____ Skip 23

0 = Blank
9 = Skip

11. **How do you *usually* use NASA technical reports (Circle choice)**

v12	1	32	Apply findings to current project
	2	17	Apply methodology to current projects
	3	3	To prepare a research proposal
16	4	4	To prepare a conference paper/journal article/technical report
	5	4	As a citation in a conference paper/journal article/technical report
	6	13	Personal/professional development
	7	1	To prepare a lecture/presentation
	8	4	To plan, budget, or manage research Skip 22

0 = Blank
9 = Skip

12. **Overall, how would you rate NASA-authorized scientific and technical information in terms of "advancing the state of the art" in your discipline?**

v13	1	30	Very important	3	5	Somewhat unimportant	5	2 No opinion
	2	40	Somewhat important	4	1	Very unimportant		
17								

0 = Blank
9 = Skip

Skip 22

13. **Extensive data tabulations, mathematical presentations, and lengthy computer programs are usually printed in the Appendix of NASA technical reports. How likely would you be to use this information if it were provided in electronic format (e.g. floppy disk) rather than the printed form? (Circle one choice in each column)**

	Data Tables/Mathematical Presentations		Computer Program Listings	
v14 18	1 18 Very likely 2 30 Somewhat likely 3 17 Somewhat unlikely 4 12 Very unlikely	0 = Blank 9 = Skip Skip 23	v15 19	1 28 Very likely 2 24 Somewhat likely 3 14 Somewhat unlikely 4 11 Very unlikely 0 = Blank 9 = Skip Skip 23

14. **NASA technical reports come in both paper and microfiche format. How likely would you be to use a *computerized, on-line system* (with full text and graphics) for NASA technical reports?**

v16 20 1 21 Very likely 2 29 Somewhat likely 3 18 Somewhat unlikely 4 11 Very unlikely
0 = Blank 9 = Skip Skip 21

v17 21 15. **Do you attend NASA-sponsored conferences and meetings?** 1 51 Yes 2 49 No (Skip to question 16)
0 = Blank

(If YES, How would you rate these conferences and meetings as a source of information for your research?

0 = Blank

v18 22 1 17 Very important 2 26 Somewhat important 3 5 Somewhat unimportant 4 2 Very unimportant 5 50 No opinion 9 = Skip

17

16. **We would like to know your opinion of *NASA-authored* scientific and technical information.**
(If you do not use NASA-authored information, skip to question 17)

	How would you rate:		Excellent	Good	Fair	Poor	No opinion	
v19	The quality of their journal articles	23	18	50	7	1	8	Skip 16
v20	The quality of their technical reports	24	21	49	9	1	3	Skip 17
v21	The precision/accuracy of the data in their technical reports	25	25	42	7	1	9	Skip 16
v22	The adequacy of the data and the documentation in their technical reports	26	16	45	15	2	5	Skip 17
v23	The organization/format of their technical reports	27	17	44	16	2	4	Skip 17
v24	The quality of the graphics (i.e. charts, figures, photos) in NASA-authored technical reports	28	21 (1)	40 (2)	16 (3)	2 (4)	4 (5)	Skip 17

0 = Blank 9 = Skip

17. **Do you use...**

			Yes, I use it	No, but I'm familiar with it	Never heard of it
v25	STAR, the NASA announcement journal which covers worldwide aerospace technical report literature?	29	31	35	34
v26	IAA, the NASA announcement journal which covers worldwide aerospace journal literature?	30	7	28	65
v27	SCAN, the NASA current awareness publication that provides you with a computer listing of new documents announced in STAR and IAA?	31	13	26	61
v28	RECON, the NASA computerized, on-line interactive system used to search and retrieve NASA scientific and technical information?	32	11 (1)	20 (2)	67 (3)

0 = Blank

18. **Next, we'd like to ask your opinion of NASA's bibliographic tools. Please indicate how strongly you *agree* or *disagree* with each of the following statements.**

		Strongly agree	Agree	Disagree	Strongly disagree	Don't know
	About STAR:					
v29	The coverage is adequate for my research	33 9	30	6	1	54
v30	The category scheme is adequate	34 8	31	5	1	55
v31	The announcements are current enough	35 5	32	4	2	53
v32	The abstracts are adequate for my research	36 6	31	5	1	57
	About IAA:			**0 = Blank**		
v33	The coverage is adequate for my research	37 4	9	3	1	83
v34	The category scheme is adequate	38 3	10	2	1	84
v35	The announcements are current enough	39 3	10	2	1	84
v36	The abstracts are adequate for my research	40 3	10	1	1	85
	About SCAN:					
v37	The announcements in SCAN are current enough	41 2	13	3	1	81
v38	SCAN is easy to use	42 3	10	4	1	82
v39	The print quality of SCAN improves its usefulness	43 2	12	3	1	82
	About RECON:					
v40	The coverage is adequate for my research	44 3	11	2	1	83
v41	RECON is easy to use	45 1	10	2	1	86
v42	The RECON database is current enough	46 1	9	3	1	86
v43	Searches of the RECON database meet my research requirements	47 2	8	3	1	86
		1	2	3	4	5

19. **What are your present professional duties?**

v44 48

1 30 Research
2 19 Administration/Mgt.
3 38 Design/Development
4 5 Teaching/Academic
5 3 Manufacturing/Production
6 2 Private Consultant
7 1 Service/Maintenance
8 1 Marketing/Sales
9 1 Other _____ 43

0 = Blank

20. **Type of organization where you work:**

v45 49

1 9 Academic
2 56 Industrial
3 3 Not-for-profit
4 17 Government (Non-NASA)
5 13 NASA
6 2 Other _____

0 = Blank

v46 50 51 21. **How many years of professional work experience do you have?** ____ years **99 = Blank**

22. **What is your AIAA interest group?**

v47 52

1 37 Aerospace Science
2 12 Aircraft Systems
3 14 Structures, Design and Test
4 18 Propulsion and Energy
5 8 Aerospace and Information Systems
6 4 Administration/Management
7 7 Other _____

0 = Blank

23. **What is your level of education?**

v48 53

1 1 No degree
2 26 Bachelors
3 44 Masters
4 29 Doctorate
5 Other _____

0 = Blank

v49 54 24. **What is your gender?** 1 95 Male 2 5 Female **0 = Blank**

	Cumulative Percentage
1 - 5	16.1
6 - 10	34.3
11 - 15	43.1
16 - 20	53.8
21 - 25	66.6
26 - 30	75.4
31 - 35	89.2
36 - 40	95.8
41 - 45	97.5
46 - 50	98.3
51 - 99	100.0

APPENDIX D

CROSS TABULATIONS

V1 USE CONFERENCE/MEETING PAPERS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
YES 1	40 / 95.2	170 / 83.3	44 / 75.9	41 / 91.1	295 / 84.5
NO 2	2 / 4.8	34 / 16.7	14 / 24.1	4 / 8.9	54 / 15.5
Column Total	42 / 12.0	204 / 58.5	58 / 16.6	45 / 12.9	349 / 100.0

Number of Missing Observations = 4

V2 USE ACADEMIC TECHNICAL REPORTS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
YES 1	28 / 66.7	115 / 56.7	28 / 48.3	24 / 53.3	195 / 56.0
NO 2	14 / 33.3	88 / 43.3	30 / 51.7	21 / 46.7	153 / 44.0
Column Total	42 / 12.1	203 / 58.3	58 / 16.7	45 / 12.9	348 / 100.0

Number of Missing Observations = 5

APPENDIX D

V3 USE TECHNICAL REPORTS FROM INDUSTRY

	Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
YES	1	24 / 57.1	172 / 84.7	35 / 60.3	36 / 80.0	267 / 76.7
NO	2	18 / 42.9	31 / 15.3	23 / 39.7	9 / 20.0	81 / 23.3
	Column Total	42 / 12.1	203 / 58.3	58 / 16.7	45 / 12.9	348 / 100.0

Number of Missing Observations = 5

V4 USE JOURNAL ARTICLES

	Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
YES	1	40 / 95.2	174 / 85.3	47 / 81.0	41 / 91.1	302 / 86.5
NO	2	2 / 4.8	30 / 14.7	11 / 19.0	4 / 8.9	47 / 13.5
	Column Total	42 / 12.0	204 / 58.5	58 / 16.6	45 / 12.9	349 / 100.0

Number of Missing Observations = 4

V5 USE GOVERNMENT/TECH REPORTS (NON-NASA)

	Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
YES	1	25 / 59.5	147 / 72.1	46 / 79.3	29 / 64.4	247 / 70.8
NO	2	17 / 40.5	57 / 27.9	12 / 20.7	16 / 35.6	102 / 29.2
	Column Total	42 / 12.0	204 / 58.5	58 / 16.6	45 / 12.9	349 / 100.0

Number of Missing Observations = 4

APPENDIX D

V6 USE NASA CONFERENCE/MEETING PAPERS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 YES	32 / 76.2	125 / 61.6	34 / 58.6	40 / 88.9	231 / 66.4
2 NO	10 / 23.8	78 / 38.4	24 / 41.4	5 / 11.1	117 / 33.6
Column Total	42 / 12.1	203 / 58.3	58 / 16.7	45 / 12.9	348 / 100.0

Number of Missing Observations = 5

V7 USE NASA-JOURNAL ARTICLES

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 YES	34 / 81.0	127 / 62.3	40 / 69.0	38 / 84.4	239 / 68.5
2 NO	8 / 19.0	77 / 37.7	18 / 31.0	7 / 15.6	110 / 31.5
Column Total	42 / 12.0	204 / 58.5	58 / 16.6	45 / 12.9	349 / 100.0

Number of Missing Observations = 4

V8 USE NASA TECHNICAL REPORTS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 YES	32 / 74.4	157 / 76.6	42 / 72.4	42 / 93.3	273 / 77.8
2 NO	11 / 25.6	48 / 23.4	16 / 27.6	3 / 6.7	78 / 22.2
Column Total	43 / 12.3	205 / 58.4	58 / 16.5	45 / 12.8	351 / 100.0

Number of Missing Observations = 2

V9 WHY DON'T YOU USE NASA TECH REPORTS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 NOT AVAILABLE	4	17	6		27
	36.4	35.4	37.5		34.6
2 NOT RELEVANT	4	14	4	1	23
	36.4	29.2	25.0	33.3	29.5
3 NOT USED		8	4	1	13
		16.7	25.0	33.3	16.7
4 NOT RELIABLE			1		1
			6.3		1.3
5 NOT TIMELY		1		1	2
		2.1		33.3	2.6
6 OTHER	3	8	1		12
	27.3	16.7	6.3		15.4
Column Total	11	48	16	3	78
	14.1	61.5	20.5	3.8	100.0

Number of Missing Observations = 275

APPENDIX D

V10 HOW DO YOU FIND OUT ABOUT NASA TECH REPT

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 BIBLIO SEARCH	6 / 18.8	41 / 26.1	7 / 17.5	9 / 21.4	63 / 23.2
2 ANNOUNCEMENT JNL	5 / 15.6	20 / 12.7	7 / 17.5	9 / 21.4	41 / 15.1
3 AWARNESS PUB	1 / 3.1	14 / 8.9	2 / 5.0	5 / 11.9	22 / 8.1
4 CITED IN REPORT	9 / 28.1	36 / 22.9	13 / 32.5	8 / 19.0	66 / 24.4
5 COLLEAGUE	7 / 21.9	21 / 13.4	4 / 10.0	6 / 14.3	38 / 14.0
6 ROUTED TO ME	3 / 9.4	16 / 10.2	5 / 12.5	5 / 11.9	29 / 10.7
7 OTHER	1 / 3.1	9 / 5.7	2 / 5.0	/	12 / 4.4
Column Total	32 / 11.8	157 / 57.9	40 / 14.8	42 / 15.5	271 / 100.0

Number of Missing Observations = 82

V11 HOW OBTAIN ACCESS TO NASA TECH REPORTS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 NASA DISTRIBUTES	2 / 6.3	16 / 10.3	2 / 4.8	8 / 19.0	28 / 10.3
2 NASA SENDS THEM	9 / 28.1	49 / 31.4	10 / 23.8	13 / 31.0	81 / 29.8
3 AUTHOR SENDS IT	5 / 15.6	6 / 3.8	3 / 7.1	2 / 4.8	16 / 5.9
4 I REQUEST IT	3 / 9.4	11 / 7.1	1 / 2.4	1 / 2.4	16 / 5.9
5 MY LIBRARY ASKS	11 / 34.4	70 / 44.9	26 / 61.9	18 / 42.9	125 / 46.0
6 OTHER	2 / 6.3	4 / 2.6			6 / 2.2
Column Total	32 / 11.8	156 / 57.4	42 / 15.4	42 / 15.4	272 / 100.0

Number of Missing Observations = 81

APPENDIX D

V12 HOW DO YOU USE NASA REPORTS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 APPLY FINDINGS	11 / 34.4	68 / 43.9	17 / 40.5	18 / 42.9	114 / 42.1
2 APPLY METHOD	6 / 18.8	36 / 23.2	10 / 23.8	9 / 21.4	61 / 22.5
3 PREPARE PROPOSAL		10 / 6.5			10 / 3.7
4 PREPARE ARTICLE	5 / 15.6	4 / 2.6	1 / 2.4	4 / 9.5	14 / 5.2
5 AS A CITATION	4 / 12.5	5 / 3.2	2 / 4.8	3 / 7.1	14 / 5.2
6 PERSONAL DEVELOP	3 / 9.4	30 / 19.4	6 / 14.3	4 / 9.5	43 / 15.9
7 PREPARE LECTURE	1 / 3.1		1 / 2.4		2 / .7
8 PLAN, BUDGET	2 / 6.3	2 / 1.3	5 / 11.9	4 / 9.5	13 / 4.8
Column Total	32 / 11.8	155 / 57.2	42 / 15.5	42 / 15.5	271 / 100.0

Number of Missing Observations = 82

APPENDIX D

V13 NASA STI ADVANCING YOUR DISCIPLINE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 VERY IMPT	16 / 51.6	44 / 28.0	17 / 40.5	27 / 64.3	104 / 38.2
2 SOMEWHAT IMPT	14 / 45.2	96 / 61.1	17 / 40.5	14 / 33.3	141 / 51.8
3 SOMEWHAT UNIMPT	1 / 3.2	12 / 7.6	4 / 9.5	1 / 2.4	18 / 6.6
4 VERY UNIMPT		2 / 1.3	1 / 2.4		3 / 1.1
5 NO OPINION		3 / 1.9	3 / 7.1		6 / 2.2
Column Total	31 / 11.4	157 / 57.7	42 / 15.4	42 / 15.4	272 / 100.0

Number of Missing Observations = 81

V14 USE OF DATA TABLES ON FLOPPY DISK

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 VERY LIKELY	5 / 15.6	39 / 25.2	8 / 19.0	12 / 28.6	64 / 23.6
2 SOMEWHAT LIKELY	12 / 37.5	58 / 37.4	15 / 35.7	19 / 45.2	104 / 38.4
3 SOMEWHAT UNLIKLY	12 / 37.5	34 / 21.9	11 / 26.2	4 / 9.5	61 / 22.5
4 VERY UNLIKELY	3 / 9.4	24 / 15.5	8 / 19.0	7 / 16.7	42 / 15.5
Column Total	32 / 11.8	155 / 57.2	42 / 15.5	42 / 15.5	271 / 100.0

Number of Missing Observations = 82

V15 USE OF COMPUTER PRGRMS ON FLOPPY DISK

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 VERY LIKELY	11 / 37.9	52 / 34.7	15 / 37.5	19 / 48.7	97 / 37.6
2 SOMEWHAT LIKELY	10 / 34.5	54 / 36.0	9 / 22.5	10 / 25.6	83 / 32.2
3 SOMEWHAT UNLIKLY	5 / 17.2	26 / 17.3	10 / 25.0	5 / 12.8	46 / 17.8
4 VERY UNLIKELY	3 / 10.3	18 / 12.0	6 / 15.0	5 / 12.8	32 / 12.4
Column Total	29 / 11.2	150 / 58.1	40 / 15.5	39 / 15.1	258 / 100.0

Number of Missing Observations = 95

V16 USE OF ON-LINE SYSTEM FOR NASA REPORTS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 VERY LIKELY	6 / 18.8	43 / 27.7	7 / 16.7	17 / 40.5	73 / 26.9
2 SOMEWHAT LIKELY	13 / 40.6	58 / 37.4	16 / 38.1	12 / 28.6	99 / 36.5
3 SOMEWHAT UNLIKLY	10 / 31.3	31 / 20.0	11 / 26.2	10 / 23.8	62 / 22.9
4 VERY UNLIKELY	3 / 9.4	23 / 14.8	8 / 19.0	3 / 7.1	37 / 13.7
Column Total	32 / 11.8	155 / 57.2	42 / 15.5	42 / 15.5	271 / 100.0

Number of Missing Observations = 82

V17 ATTEND NASA-SPONSORED CONFERENCES ?

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 YES	21 / 50.0	90 / 45.0	25 / 43.1	43 / 95.6	179 / 51.9
2 NO	21 / 50.0	110 / 55.0	33 / 56.9	2 / 4.4	166 / 48.1
Column Total	42 / 12.2	200 / 58.0	58 / 16.8	45 / 13.0	345 / 100.0

Number of Missing Observations = 8

V18 CONFERENCES AS SOURCE OF INFO

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 VERY IMPT	7 / 35.0	25 / 28.1	8 / 32.0	20 / 48.8	60 / 34.3
2 SOMEWHAT IMPT	11 / 55.0	51 / 57.3	11 / 44.0	20 / 48.8	93 / 53.1
3 SOMEWHAT UNIMPT	1 / 5.0	11 / 12.4	4 / 16.0	1 / 2.4	17 / 9.7
5 NO OPINION	1 / 5.0	2 / 2.2	2 / 8.0		5 / 2.9
Column Total	20 / 11.4	89 / 50.9	25 / 14.3	41 / 23.4	175 / 100.0

Number of Missing Observations = 178

APPENDIX D

V19 QUALITY OF NASA'S JOURNALS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 EXCELLENT	8 / 20.0	26 / 16.3	12 / 25.5	15 / 34.1	61 / 21.0
2 GOOD	25 / 62.5	104 / 65.0	24 / 51.1	24 / 54.5	177 / 60.8
3 FAIR	3 / 7.5	15 / 9.4	5 / 10.6	1 / 2.3	24 / 8.2
4 POOR		2 / 1.3	1 / 2.1		3 / 1.0
5 NO OPINION	4 / 10.0	13 / 8.1	5 / 10.6	4 / 9.1	26 / 8.9
Column Total	40 / 13.7	160 / 55.0	47 / 16.2	44 / 15.1	291 / 100.0

Number of Missing Observations = 62

V20 QUALITY OF NASA'S TECHNICAL REPORTS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 EXCELLENT	11 / 27.5	34 / 21.3	11 / 23.4	19 / 43.2	75 / 25.8
2 GOOD	23 / 57.5	100 / 62.5	28 / 59.6	22 / 50.0	173 / 59.5
3 FAIR	3 / 7.5	20 / 12.5	4 / 8.5	2 / 4.5	29 / 10.0
4 POOR		2 / 1.3	1 / 2.1		3 / 1.0
5 NO OPINION	3 / 7.5	4 / 2.5	3 / 6.4	1 / 2.3	11 / 3.8
Column Total	40 / 13.7	160 / 55.0	47 / 16.2	44 / 15.1	291 / 100.0

Number of Missing Observations = 62

APPENDIX D

V21 PRECISION/ACCURACY OF THE DATA

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 EXCELLENT	12	44	10	22	88
	30.0	27.5	21.3	50.0	30.2
2 GOOD	17	84	26	19	146
	42.5	52.5	55.3	43.2	50.2
3 FAIR	3	15	5	2	25
	7.5	9.4	10.6	4.5	8.6
4 POOR		2			2
		1.3			.7
5 NO OPINION	8	15	6	1	30
	20.0	9.4	12.8	2.3	10.3
Column Total	40	160	47	44	291
	13.7	55.0	16.2	15.1	100.0

Number of Missing Observations = 62

V22 ADEQUACY OF DATA/DOCUMENTATION

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 EXCELLENT	10	25	5	15	55
	25.0	15.6	10.6	34.1	18.9
2 GOOD	19	93	26	22	160
	47.5	58.1	55.3	50.0	55.0
3 FAIR	6	27	12	6	51
	15.0	16.9	25.5	13.6	17.5
4 POOR	1	6	1		8
	2.5	3.8	2.1		2.7
5 NO OPINION	4	9	3	1	17
	10.0	5.6	6.4	2.3	5.8
Column Total	40	160	47	44	291
	13.7	55.0	16.2	15.1	100.0

Number of Missing Observations = 62

APPENDIX D

V23 REPORT ORGANIZATION/FORMAT

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 EXCELLENT	13	32	5	11	61
	32.5	20.1	10.6	25.0	21.0
2 GOOD	18	83	28	27	156
	45.0	52.2	59.6	61.4	53.8
3 FAIR	5	35	10	4	54
	12.5	22.0	21.3	9.1	18.6
4 POOR	1	2	2	1	6
	2.5	1.3	4.3	2.3	2.1
5 NO OPINION	3	7	2	1	13
	7.5	4.4	4.3	2.3	4.5
Column Total	40	159	47	44	290
	13.8	54.8	16.2	15.2	100.0

Number of Missing Observations = 63

V24 QUALITY OF THE GRAPHICS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 EXCELLENT	12	33	12	16	73
	30.0	20.5	25.5	36.4	25.0
2 GOOD	17	81	24	20	142
	42.5	50.3	51.1	45.5	48.6
3 FAIR	7	37	7	6	57
	17.5	23.0	14.9	13.6	19.5
4 POOR	1	2	1	1	5
	2.5	1.2	2.1	2.3	1.7
5 NO OPINION	3	8	3	1	15
	7.5	5.0	6.4	2.3	5.1
Column Total	40	161	47	44	292
	13.7	55.1	16.1	15.1	100.0

Number of Missing Observations = 61

V25 DO YOU USE STAR

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 YES, I USE IT	18 / 42.9	48 / 24.2	14 / 24.6	28 / 62.2	108 / 31.6
2 NO, BUT FAMILIAR	9 / 21.4	79 / 39.9	22 / 38.6	13 / 28.9	123 / 36.0
3 NEVER HEARD OF	15 / 35.7	71 / 35.9	21 / 36.8	4 / 8.9	111 / 32.5
Column Total	42 / 12.3	198 / 57.9	57 / 16.7	45 / 13.2	342 / 100.0

Number of Missing Observations = 11

V26 DO YOU USE IAA

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 YES, I USE IT	6 / 14.3	9 / 4.7	2 / 3.5	9 / 20.5	26 / 7.7
2 NO, BUT FAMILIAR	7 / 16.7	58 / 30.1	13 / 22.8	19 / 43.2	97 / 28.9
3 NEVER HEARD OF	29 / 69.0	126 / 65.3	42 / 73.7	16 / 36.4	213 / 63.4
Column Total	42 / 12.5	193 / 57.4	57 / 17.0	44 / 13.1	336 / 100.0

Number of Missing Observations = 17

V27 DO YOU USE SCAN

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 YES, I USE IT	8 / 19.0	19 / 9.8	7 / 12.3	10 / 22.7	44 / 13.1
2 NO, BUT FAMILIAR	10 / 23.8	53 / 27.5	11 / 19.3	19 / 43.2	93 / 27.7
3 NEVER HEARD OF	24 / 57.1	121 / 62.7	39 / 68.4	15 / 34.1	199 / 59.2
Column Total	42 / 12.5	193 / 57.4	57 / 17.0	44 / 13.1	336 / 100.0

Number of Missing Observations = 17

V28 DO YOU USE RECON

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 YES, I USE IT	3 / 7.1	10 / 5.2	2 / 3.4	23 / 52.3	38 / 11.2
2 NO, BUT FAMILIAR	9 / 21.4	40 / 20.6	10 / 17.2	12 / 27.3	71 / 21.0
3 NEVER HEARD OF	30 / 71.4	144 / 74.2	46 / 79.3	9 / 20.5	229 / 67.8
Column Total	42 / 12.4	194 / 57.4	58 / 17.2	44 / 13.0	338 / 100.0

Number of Missing Observations = 15

V29 STAR COVERAGE IS ADEQUATE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE	3 / 13.6	16 / 21.1	2 / 8.0	7 / 21.2	28 / 17.9
2 AGREE	18 / 81.8	50 / 65.8	17 / 68.0	22 / 66.7	107 / 68.6
3 DISAGREE	1 / 4.5	10 / 13.2	6 / 24.0	3 / 9.1	20 / 12.8
4 STRONGLY DISAGRE				1 / 3.0	1 / .6
Column Total	22 / 14.1	76 / 48.7	25 / 16.0	33 / 21.2	156 / 100.0

Number of Missing Observations = 197

V30 STAR CATEGORY SCHEME IS ADEQUATE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE	2 / 10.0	15 / 20.3	3 / 12.0	7 / 21.2	27 / 17.8
2 AGREE	16 / 80.0	48 / 64.9	17 / 68.0	25 / 75.8	106 / 69.7
3 DISAGREE	1 / 5.0	11 / 14.9	5 / 20.0		17 / 11.2
4 STRONGLY DISAGRE	1 / 5.0			1 / 3.0	2 / 1.3
Column Total	20 / 13.2	74 / 48.7	25 / 16.4	33 / 21.7	152 / 100.0

Number of Missing Observations = 201

V31 STAR ANNOUNCEMENTS ARE CURRENT

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE	2 / 9.5	10 / 14.1	3 / 12.0	4 / 12.1	19 / 12.7
2 AGREE	16 / 76.2	52 / 73.2	17 / 68.0	26 / 78.8	111 / 74.0
3 DISAGREE	2 / 9.5	5 / 7.0	4 / 16.0	2 / 6.1	13 / 8.7
4 STRONGLY DISAGRE	1 / 4.8	4 / 5.6	1 / 4.0	1 / 3.0	7 / 4.7
Column Total	21 / 14.0	71 / 47.3	25 / 16.7	33 / 22.0	150 / 100.0

Number of Missing Observations = 203

V32 STAR ABSTRACTS ARE ADEQUATE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE	2 / 9.5	13 / 17.6	1 / 4.0	7 / 21.2	23 / 15.0
2 AGREE	17 / 81.0	53 / 71.6	16 / 64.0	24 / 72.7	110 / 71.9
3 DISAGREE	1 / 4.8	6 / 8.1	8 / 32.0	1 / 3.0	16 / 10.5
4 STRONGLY DISAGRE	1 / 4.8	2 / 2.7		1 / 3.0	4 / 2.6
Column Total	21 / 13.7	74 / 48.4	25 / 16.3	33 / 21.6	153 / 100.0

Number of Missing Observations = 200

V33 IAA COVERAGE IS ADEQUATE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE	1 14.3	7 28.0		5 33.3	13 24.1
2 AGREE	5 71.4	13 52.0	4 57.1	9 60.0	31 57.4
3 DISAGREE	1 14.3	4 16.0	3 42.9	1 6.7	9 16.7
4 STRONGLY DISAGRE		1 4.0			1 1.9
Column Total	7 13.0	25 46.3	7 13.0	15 27.8	54 100.0

Number of Missing Observations = 299

V34 IAA CATEGORY SCHEME IS ADEQUATE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE	1 14.3	5 21.7		5 33.3	11 21.2
2 AGREE	6 85.7	15 65.2	4 57.1	10 66.7	35 67.3
3 DISAGREE		3 13.0	3 42.9		6 11.5
Column Total	7 13.5	23 44.2	7 13.5	15 28.8	52 100.0

Number of Missing Observations = 301

V35 IAA ANNOUNCEMENTS ARE CURRENT

Count / Col Pct	ACADEMIC NON-PROF (1)	INDUS-TRIAL (2)	GOVT (4)	NASA (5)	Row Total
1 STRONGLY AGREE	1 / 12.5	6 / 26.1		3 / 20.0	10 / 18.9
2 AGREE	6 / 75.0	14 / 60.9	4 / 57.1	11 / 73.3	35 / 66.0
3 DISAGREE	1 / 12.5	2 / 8.7	3 / 42.9	1 / 6.7	7 / 13.2
4 STRONGLY DISAGRE		1 / 4.3			1 / 1.9
Column Total	8 / 15.1	23 / 43.4	7 / 13.2	15 / 28.3	53 / 100.0

Number of Missing Observations = 300

V36 IAA ABSTRACTS ARE ADEQUATE

Count / Col Pct	ACADEMIC NON-PROF (1)	INDUS-TRIAL (2)	GOVT (4)	NASA (5)	Row Total
1 STRONGLY AGREE	1 / 12.5	6 / 25.0		5 / 33.3	12 / 22.2
2 AGREE	7 / 87.5	15 / 62.5	5 / 71.4	9 / 60.0	36 / 66.7
3 DISAGREE		2 / 8.3	2 / 28.6	1 / 6.7	5 / 9.3
4 STRONGLY DISAGRE		1 / 4.2			1 / 1.9
Column Total	8 / 14.8	24 / 44.4	7 / 13.0	15 / 27.8	54 / 100.0

Number of Missing Observations = 299

V37 SCAN ANNOUNCEMENTS ARE CURRENT

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE		4 15.4	1 11.1	3 18.8	8 12.5
2 AGREE	9 69.2	18 69.2	5 55.6	13 81.3	45 70.3
3 DISAGREE	4 30.8	4 15.4	3 33.3		11 17.2
Column Total	13 20.3	26 40.6	9 14.1	16 25.0	64 100.0

Number of Missing Observations = 289

V38 SCAN IS EASY TO USE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE	1 9.1	3 12.0	2 22.2	5 31.3	11 18.0
2 AGREE	6 54.5	17 68.0	5 55.6	7 43.8	35 57.4
3 DISAGREE	4 36.4	5 20.0	2 22.2	3 18.8	14 23.0
4 STRONGLY DISAGRE				1 6.3	1 1.6
Column Total	11 18.0	25 41.0	9 14.8	16 26.2	61 100.0

Number of Missing Observations = 292

V39 SCAN PRINT QUALITY IMPROVES USE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE		4	1	3	8
		16.7	11.1	23.1	13.6
2 AGREE	10	16	7	9	42
	76.9	66.7	77.8	69.2	71.2
3 DISAGREE	3	4	1	1	9
	23.1	16.7	11.1	7.7	15.3
Column Total	13	24	9	13	59
	22.0	40.7	15.3	22.0	100.0

Number of Missing Observations = 294

V40 RECON COVERAGE IS ADEQUATE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE		2		6	8
		12.5		23.1	15.4
2 AGREE	5	12	3	17	37
	100.0	75.0	60.0	65.4	71.2
3 DISAGREE		2	1	3	6
		12.5	20.0	11.5	11.5
4 STRONGLY DISAGRE			1		1
			20.0		1.9
Column Total	5	16	5	26	52
	9.6	30.8	9.6	50.0	100.0

Number of Missing Observations = 301

V41 RECON IS EASY TO USE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE		1 7.7		3 11.5	4 8.3
2 AGREE	3 75.0	10 76.9	2 40.0	18 69.2	33 68.8
3 DISAGREE		1 7.7	2 40.0	5 19.2	8 16.7
4 STRONGLY DISAGRE	1 25.0	1 7.7	1 20.0		3 6.3
Column Total	4 8.3	13 27.1	5 10.4	26 54.2	48 100.0

Number of Missing Observations = 305

V42 RECON DATABASE IS CURRENT

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE		1 7.7		3 11.5	4 8.3
2 AGREE	4 80.0	8 61.5	2 50.0	18 69.2	32 66.7
3 DISAGREE	1 20.0	3 23.1	1 25.0	5 19.2	10 20.8
4 STRONGLY DISAGRE		1 7.7	1 25.0		2 4.2
Column Total	5 10.4	13 27.1	4 8.3	26 54.2	48 100.0

Number of Missing Observations = 305

V43 RECON SEARCHES MEET REQUIREMENTS

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 STRONGLY AGREE	1 / 20.0	1 / 7.7		6 / 23.1	8 / 16.7
2 AGREE	2 / 40.0	8 / 61.5	2 / 50.0	15 / 57.7	27 / 56.3
3 DISAGREE	2 / 40.0	4 / 30.8	1 / 25.0	4 / 15.4	11 / 22.9
4 STRONGLY DISAGRE			1 / 25.0	1 / 3.8	2 / 4.2
Column Total	5 / 10.4	13 / 27.1	4 / 8.3	26 / 54.2	48 / 100.0

Number of Missing Observations = 305

APPENDIX D

V44 PROFESSIONAL DUTIES

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 RESEARCH	18	49	15	22	104
	41.9	23.9	25.9	48.9	29.6
2 ADMIN/MGMT	4	35	18	10	67
	9.3	17.1	31.0	22.2	19.1
3 DESIGN/DEVELPMT	3	102	16	12	133
	7.0	49.8	27.6	26.7	37.9
4 TEACHING	14		4		18
	32.6		6.9		5.1
5 MANUFACTURING		7	1	1	9
		3.4	1.7	2.2	2.6
6 PRIVATE CONSULT	3	3			6
	7.0	1.5			1.7
7 SERVICE/MAINT.		1	1		2
		.5	1.7		.6
8 MARKETING/SALES		6			6
		2.9			1.7
9 OTHER	1	2	3		6
	2.3	1.0	5.2		1.7
Column Total	43	205	58	45	351
	12.3	58.4	16.5	12.8	100.0

Number of Missing Observations = 2

V46 YEARS OF PROFESSIONAL WORK EXPERIENCE

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
5	10	27	11	9	57
1-5 YRS	23.3	13.4	19.3	20.0	16.5
10	3	46	8	7	64
6-10	7.0	22.9	14.0	15.6	18.5
15	5	13	10	2	30
11-15	11.6	6.5	17.5	4.4	8.7
20	9	16	8	5	38
16-20	20.9	8.0	14.0	11.1	11.0
30	10	50	13	17	90
21-30	23.3	24.9	22.8	37.8	26.0
31	6	49	7	5	67
31 AND OVER	14.0	24.4	12.3	11.1	19.4
Column Total	43	201	57	45	346
	12.4	58.1	16.5	13.0	100.0

Number of Missing Observations = 7

APPENDIX D

V47 AIAA INTEREST GROUP

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 AEROSPACE SCI	19 / 45.2	69 / 34.2	18 / 31.6	21 / 48.8	127 / 36.9
2 AIRCRAFT SYSTEMS	4 / 9.5	28 / 13.9	7 / 12.3	1 / 2.3	40 / 11.6
3 STRUCTURE/DESIGN	6 / 14.3	25 / 12.4	14 / 24.6	4 / 9.3	49 / 14.2
4 PROPULSION/ENRGY	7 / 16.7	38 / 18.8	8 / 14.0	8 / 18.6	61 / 17.7
5 AEROSPACE/INFO		18 / 8.9	7 / 12.3	2 / 4.7	27 / 7.8
6 ADMIN/MGMT	3 / 7.1	6 / 3.0	2 / 3.5	3 / 7.0	14 / 4.1
7 OTHER	3 / 7.1	18 / 8.9	1 / 1.8	4 / 9.3	26 / 7.6
Column Total	42 / 12.2	202 / 58.7	57 / 16.6	43 / 12.5	344 / 100.0

Number of Missing Observations = 9

V48 EDUCATION

Count / Col Pct	ACADEMIC NON-PROF 1	INDUS-TRIAL 2	GOVT 4	NASA 5	Row Total
1 NO DEGREE		1 .5			1 .3
2 BACHELORS		60 29.3	20 34.5	13 28.9	93 26.5
3 MASTERS	9 20.9	98 47.8	25 43.1	23 51.1	155 44.2
4 DOCTORATE	34 79.1	46 22.4	13 22.4	9 20.0	102 29.1
Column Total	43 12.3	205 58.4	58 16.5	45 12.8	351 100.0

Number of Missing Observations = 2

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Myron Glassman: Old Dominion University, Norfolk, VA

16. Abstract

A pilot study was conducted to evaluate selected NASA scientific and technical information (STI) products. The study, which utilized survey research in the form of a self-administered mail questionnaire, had a twofold purpose -- to gather baseline data regarding the use and perceived usefulness of selected NASA STI products and to develop/validate questions that could be used in a future study concerned with the role of the U.S. government technical report in aeronautics.

The sample frame consisted of 25 000 members of the American Institute of Aeronautics and Astronautics in the U.S. with academic, government, or industrial affilation. Simple random sampling was used to select 2000 individuals to participate in the study. Three hundred fifty-three (353) usable questionnaires (17% response rate) were received by the established cutoff date.

The findings indicate that NASA STI is used and is generally perceived as being important; the use rate for NASA-authored conference/meeting papers, journal articles, and technical reports is fairly uniform; a considerable number of respondents are unfamiliar with STAR, IAA, SCAN, and RECON; a considerable number of respondents who are familiar with these media do not use them; and the perceived quality of NASA-authored journal articles and technical reports is very good.

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