A Question of Quality: The Effect of Source Quality on Information Seeking by Women in IT Professions

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Abstract

This paper presents preliminary results from a study of how women in information technology (IT) professions use a range of information sources in their day-to-day work activities. Through a questionnaire survey, the study investigates the effects of Perceived Source Accessibility and Perceived Source Quality on the selection and use of information sources. Thirteen information sources, including the World Wide Web and Web-based computer-mediated communication, were identified. Sixty-seven participants completed the survey. The most frequently used information source is the World Wide Web, followed by mass media, colleagues in the same department, computer-mediated communication, business professionals and associates, and colleagues in a different group/department. The least used information sources are the internal library, and competitors. For many of the sources, there was a strong relationship between perceived source quality and source usage. This finding runs counter to early, well-known studies that concluded that scientists and engineers selected sources based only on their accessibility. Surprisingly, the present study did not find a significant relationship between source accessibility and source usage. The implications for research are discussed.

Introduction

This paper presents preliminary results from a study of how women in information technology (IT) professions use a range of information sources in their day-to-day work activities. The study has two particular areas of focus. First, it investigates information-seeking behavior by women IT professionals, who constitute a minority population in the IT sector (Catalyst, 2000a b). Second, it has a special interest in the perception and use of the Web as an information source relative to the full range of print, human, and electronic sources that are normally encountered in the workplace. Of some interest is the convergence of computer-mediated communication (e.g. Web-based chatrooms and bulletin boards) through the Web interface and the use of that information source in the IT workplace by female IT workers whose minority status may cause them to seek IT information, as well as mentoring and support, from others outside their workplace. In particular, women in IT professions subscribed to women in IT listservs. Chatman's theory of information poverty (1992, 1996) would tend to support this assumption. Research on women's communication styles and problem solving strategies would tend to support a role for CMC in the information seeking behaviour of women in IT professions (Tannen 1990; Spender 1996). The overall objective of the study is to explore to what extent the usage of different information sources may be explained by the perceptions of source quality and source accessibility.

1 Theoretical Framework

The study focuses on the effects of Perceived Source Accessibility and Perceived Source Quality on the selection and use of information sources.

1.1 Perceived Source Accessibility

In an early but still influential study by Gerstberger and Allen (1968), subjects were asked to rank nine information channels on the basis of their perceived accessibility, perceived ease of use, perceived technical quality, and degree of experience.

Accessibility was then defined as "The degree to which one can attain meaningful contact with the channel – in other words just how easy it is to approach, obtain, or contact the channel (without giving consideration to the reliability of quality of the information expected)" (Allen 1977, 182).

After reviewing the concept of perceived accessibility in organizational communication, library science, and management information systems, Culnan (1985) summarized that in organizational communication, source accessibility has generally been defined as both the social and economic costs associated with acquiring information, whereas in library and information science literature, accessibility is generally defined in terms of the 'physical' costs of use, especially the physical distance of the library from the user. Culnan (1985) proposes perceived source accessibility as the unifying concept for the design and evaluation of a wide variety of information systems and services and defines perceived accessibility as the "expected level of effort required to use a particular information source" (Culnan 1985, 302). She identifies three dimensions of accessibility: gaining physical access to the information source (physical dimension); translating an information need or request into a language that is understood by the source (interface dimension); and being able to physically retrieve the potentially relevant information (informational dimension).

O'Reilly (1982) tested an item pool of eighteen questions to measure perceived accessibility and quality of information sources. His analysis revealed that three questions from his pool represented source accessibility. These questions concerned the 'time, expense, or difficulty in obtaining information from the source,' 'how easy to get at is the information,' and 'how difficult is it to get information from the source' (O'Reilly 1982, 762-3). For the present study, we identify "time and effort needed to approach, contact, or locate the source," and "ease of getting desired information from the source" as the two dimensions of perceived source accessibility.

1.2 Perceived Source Quality
The concept of information *'relevance'* is fundamental in the development of information science. Saracevic (1970) includes in his summary list of definitions the notions that relevance is "a

measure of usefulness of an answer" and "an indication of significance to an important purpose." Relevant information includes "ideas or facts so closely related to the problem at hand that disregarding them would alter the problem" (p.120). He then defines relevance as a relationship in the form of an algorithm: "Relevance is the (A) gauge of relevance of an (B) aspect of relevance existing between an (C) object judged and a (D) frame of reference as judged by a (E) assessor" (p.120-121). Eisenberg and Schamber (1988) interpret this definition as: "Relevance is a measure of utility existing between a document and a question as judged by a requester" (p.166). In his study comparing the impact of source accessibility and quality on the use of information sources by decision makers, O'Reilly (1982) determined that relevance is a main dimension of perceived source quality (the other dimensions being accuracy, reliability, and timeliness). The present study identifies relevance as one dimension of the quality of information from a source. Recent studies on relevance have focused on judgments of partial relevance for retrieved items (Spink & Greisdorf 1997; Spink, Greisdorf & Bateman 1998, 1999). Maglaughlin and Sonnenwald (2002) found that content was the most frequently mentioned criterion of relevance, and multiple criteria are used in relevance judgments.

Taylor (1986) suggests that the *reliability* of a source represents the summation of many of the values of that source. He defines reliability as "the trust a user has in the consistency of quality performance of the system and its outputs over time." The system or source is "consistent in maintaining its accepted level of accuracy, of currency, of comprehensiveness (or selectivity as the case may be), and it can be relied upon to do so in the future" (p.64). Nilan and his colleagues (1988) investigated the source evaluation criteria that information seekers apply. They interviewed subjects about the sequences of information seeking and use events that they have experienced. The transcripts were then content-analyzed to extract the criteria that the subjects used to evaluate their information sources. The initial research has identified a number of criteria for the acceptance or rejection of information, sources, and information seeking strategies (Nilan, Peek and Snyder 1988; Halpern and Nilan 1988). Among the fifteen source criteria that were reported most frequently, the top five were "Authority or expertise

based on credentials," "Authority or expertise based on experience," "Only perceived source," and "Trust." The present study identifies reliability as the second dimension of the quality of an information source.

2 Research Method
2.1 Questionnaire Design
The questionnaire instrument for the women in IT study was largely derived from the one developed by Choo, Deltor and Turnbull (2000) for their 1998 study of IT managers use of the Web. Their instrument is in turn based on one devised by Auster & Choo (1993) in a study of environmental scanning by CEOs in two Canadian industries. Two relatively new electronic information sources were added – Computer Mediated Communication and Intranet/Portal. The first part of the questionnaire examines perception and use of information source. The intent was to measure participant perception of each information source used in typical work activity and to examine the relationship between perceptions

of source quality and accessibility and frequency of source usage. The attributes of quality (relevance and reliability) and accessibility (time and effort, and ease to get the desired information) were measured. For each attribute, participants indicated their responses on ascending Likert scales.

Thirteen information sources, including the World Wide Web and Web-based computer-mediated communication, were presented according to a classification scheme of information sources proposed by Auster & Choo (1993). As shown in Table 1, external information sources are those outside of a company's organizational structure, while internal information sources are ones available within an organization only. External and internal categories are divided further into people and non-people information sources. (The option, Other Sources, was also provided.)

Table 1. Types of Information Sources

External People Sources Customers Business & Professional Associates Competitors	**Internal People Sources** Managers/Supervisors Colleagues in the same group/dept Colleagues in different group/dept
External Non-People Sources World Wide Web: websites World Wide Web: communication (CMC) Radio/TV/Newspapers External reports & studies; Periodicals and Journals	**Internal Non-People Sources** Intranet/Portal Internal memos Internal library/information centre

Respondents in the study assess the 13 information sources according to two 'source accessibility' questions:

(1) How much of your time and effort is needed to approach, contact, or locate each information source?
(2) After contacting or locating the source, how easy is it to get the desired information from that source?

Respondents assess the 13 information sources according to two 'source quality' questions:

(1) How relevant is the information from each source about the environment? Relevant information is information that is *needed* and *useful* with respect to the goals and activities of your organization.
(2) How reliable is the information from each source about the environment? Information is reliable when it is *authoritative* and *dependable*. It is information that you personally *trust*.

The survey questionnaire was made available to participants in many formats, including paper copy; Word or PDF file sent as e-mail file attachments; and

a HTML questionnaire form on a Web page. The Web format had the advantage of automating data collection through the use of Microsoft Active Server Pages and Access database technology.

2.2 Survey Respondents

Women in IT professions were recruited using print flyers publicizing the study, which were distributed at meetings of a local women's Internet group, Toronto WebGrrls (WebGrrls was renamed as Digital Eve), as well as at a Knowledge Media Design Institute lecture held at the University of Toronto, and posted on bulletin boards in various buildings in the downtown Toronto area that rent space to IT companies. The primary vehicle for publicizing the study was the Internet, through announcements on IT listservs, including listservs of women in IT associations, newsgroups for computer and Internet technical issues, two women in IT association web sites, and the corporate intranet of a large Canadian telecommunications company. (A list of all publicity venues is provided online at http://www.slais.ubc.ca/marton/publist.pdf.)

Sixty-seven participants completed the survey questionnaire. Forty completed the print version and faxed the document to the researchers or completed it electronically in Microsoft Word and submitted it by electronic mail as a file attachment. Twenty-seven participants completed the online Web version of the questionnaire and responses were automatically collected in a Microsoft Access database table. Data from the database table was pasted into a Microsoft Excel spreadsheet while data from the print questionnaires was manually entered into the spreadsheet. The complete data set was imported into SPSS 10.1.0 for calculation of descriptive statistics, and correlation and regression analysis.

Demographic information about the study participants is detailed first. Slightly more than two thirds of participants are between the ages of 25-44 (69%), while 28% are between the ages of 45-64, and only 3% are between ages 15-24. The highest educational level achieved was the university baccalaureate degree (42%). One third had completed graduate level university education (master's degree, 27% and doctorate, 4.5%). Quite a few participants

had only a high school diploma (21%) while a few had a college diploma (6%). In terms of seniority (number of years in current position), 45% had been working at their current position for 1-3 years while 25% had less than one year's experience in their current position.

Study participants represent many fields and specialties in the IT sector (network engineer, programmer, database developer, technical support staff, trainer, webmaster, web designer, business analyst, consultant, faculty librarian). They work in a range of organizational positions (CEO, manager, director, coordinator, support staff) and settings (information systems, customer service, library, research and development) in the corporate, government, and not-for-profit sectors. A few participants owned small web design or Internet consulting businesses and thus did not work in organizational settings.

All participants use computers as part of their daily work. The vast majority (97%) rated their computer expertise as intermediate (36%), or intermediate/expert (28%), or expert (33%). Similarly, most rated their Web expertise as intermediate (24%) or better (intermediate/expert, 43%; expert, 31%). Nearly 50% of participants have their own home page.

3 Findings
3.1 Frequency of Source Use

The dependent variable, *frequency of source use,* was measured on a Likert scale as follows: 1=never, 2=less than once a year, 3=few times a year, 4=at least once a month, 5=at least once a week, and 6=at least once a day. The mean responses from participants are shown in Figure 1. The most frequently used information source by far is the World Wide Web, followed by mass media, colleagues in the same department, computer-mediated communication, business professionals and associates, and colleagues in a different group/department. The least used information sources are the internal library and competitors.
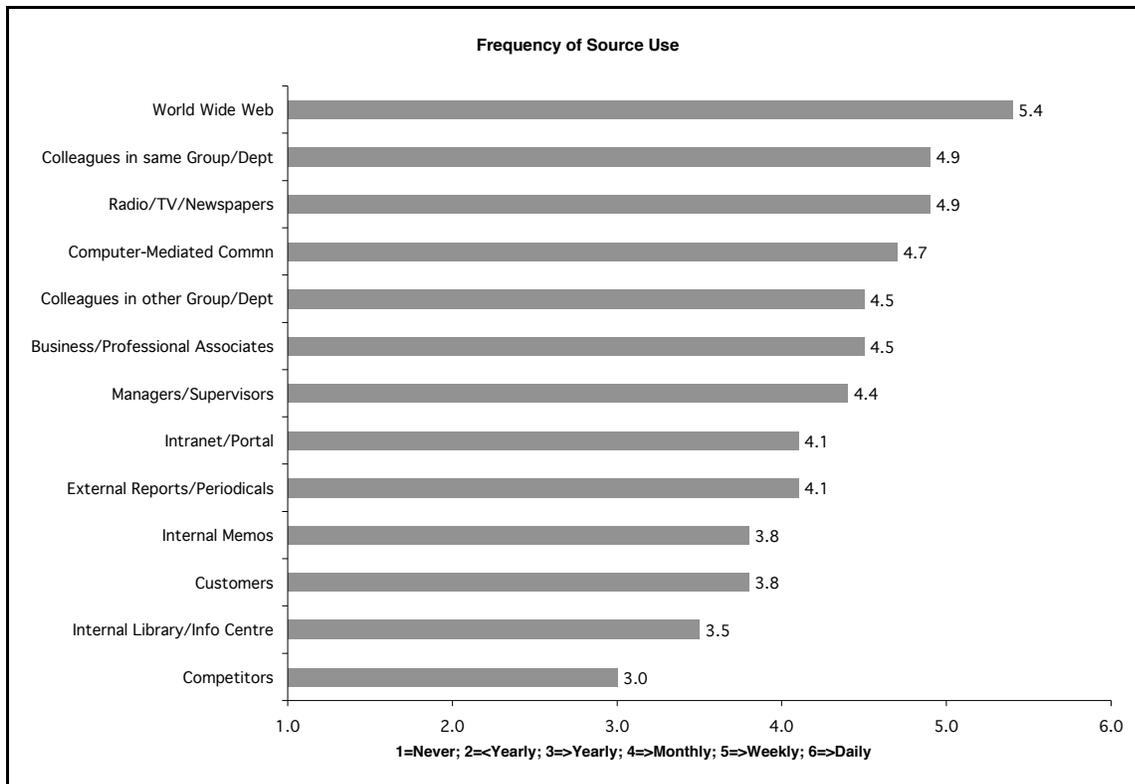
Figure 1. Frequency of Use of Information Sources

Participants were also asked how many hours they spend seeking information on trends and events in the external environment in a typical working day using all available information sources. Twenty-six percent of participants spend an hour or less on this activity. However, approximately 16% spend two hours and another 16% spend three hours. Considering only the Web, the vast majority (98.5%) spend six hours or less using the Web for information seeking on external trends and events, with 22% spending one hour, 21% spending two hours, and a small group (6%) spending four hours on this activity.

3.2 Perceived Source Quality and Accessibility
Table 2 and 3 summarize participant perceptions of quality and accessibility of information sources. Clearly, for both attributes of accessibility, the information sources that are closest at hand, in the literal sense, are those that are considered to be most accessible. These information sources are the electronic sources available on the workplace desktop computer – intranet/portal, World Wide Web, computer-mediated communication, as well as colleagues in the same group/department. Not surprisingly, the information source with which

participants are least likely to have contact, namely competitors, is ranked lowest in terms of accessibility. The internal library/information centre is ranked poorly, just above competitors.

For computer-based information sources, we find the World Wide Web rates extremely high on relevance and intermediate/high on reliability and accessibility measures. Computer-mediated communication rates highly for accessibility measures and relevance but intermediate for reliability. The intranet/portal receives high ratings on accessibility measures but intermediate ratings for quality measures.

For interpersonal sources, colleagues in the same department are rated highly on both measures of quality and accessibility. Managers/supervisors rate highly on quality measures but intermediate on both accessibility measures. Business and professional associates rate very highly on both measures of quality and fairly high on ease in getting desired information, but poorly on time and effort to contact source. Competitors receive the lowest ratings on accessibility and reliability but are intermediate in

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relevance, suggesting they possess useful information that is difficult to obtain.

Mass media rate highly on one measure of accessibility (time and effort) but low on the second measure of accessibility (ease in getting desired information) and low in relevance and reliability.

This would seem to indicate that although they are readily available, extracting information is not easy and the information is not considered to be of high quality. Similarly, internal memos receive higher ratings for accessibility than quality. The internal library/information centre receives low ratings on both quality and accessibility measures.

Table 2. Perceived Quality and Accessibility of Information Sources

	Perceived Source Quality: Relevance (mean)	Perceived Source Quality: Reliability (mean)	Perceived Source Accessibility: Time & Effort (mean)	Perceived Source Accessibility: Getting Info (mean)
External People Sources				
Customers	3.8	3.5	3.2	3.2
Business and professional associates	4.3	4.0	3.2	3.7
Competitors	3.5	3.0	2.9	2.4
External Non-People Sources				
World Wide Web	4.3	3.7	3.6	3.9
Computer-mediated communication	4.0	3.5	3.8	3.8
Mass media (radio, TV, newspapers)	3.3	3.3	3.8	3.4
External reports, periodicals, etc	3.8	3.9	3.4	3.5
Internal People Sources				
Managers/Supervisors	3.9	3.8	3.5	3.5
Colleagues in the same group/dept	4.1	4.1	3.9	3.9
Colleagues in different group/dept	3.8	3.8	3.5	3.6
Internal Non-People Sources				
Intranet/Portal	3.4	3.5	3.9	3.8
Internal Memos	3.2	3.5	3.6	3.6
Internal library/information centre	3.3	3.5	3.4	3.4

Table 3. Ranking of Sources by Perceived Quality and Accessibility Attributes

Rank		Perceived Source Quality				Perceived Source Accessibility		
		Relevance		Reliability		Time and effort		Ease in getting information
1	4.3	World Wide Web	4.1	colleagues in the same group/department	3.9	intranet/portal	3.9	intranet/portal
2	4.3	business/professional associates	4.0	business/professional associates	3.9	colleagues in same group/ department	3.9	World Wide Web
3	4.1	colleagues in same group/department	3.9	external reports, studies; periodicals, journals	3.8	computer-mediated communication	3.9	colleagues in same group/department
4	4.0	computer-mediated communication	3.8	colleagues in different group/department	3.8	mass media	3.8	computer-mediated communication
5	3.9	managers/supervisors	3.8	managers/supervisors	3.6	World Wide Web	3.7	business/professional associates
6	3.8	customers	3.7	World Wide Web	3.6	internal memos	3.6	colleagues in different group/department
7	3.8	colleagues in different group /department	3.5	customers	3.5	managers/supervisors	3.6	internal memos
8	3.8	external reports, studies; periodicals, journals	3.5	computer-mediated communication	3.5	colleagues in different group/department	3.5	external reports, studies; periodicals, journals
9	3.5	competitors	3.5	intranet/portal	3.4	external reports, studies; periodicals, journals	3.5	managers/supervisors
10	3.4	intranet/portal	3.5	internal memos	3.4	internal library/ information center	3.4	internal library/ information centre
11	3.3	mass media	3.4	internal library/ information centre	3.2	customers	3.4	mass media
12	3.3	internal library/ information centre	3.3	mass media	3.2	business/professional associates	3.2	customers
13	3.2	internal memos	3.0	competitors	2.9	competitors	2.4	competitors

4 Correlation Analysis

To measure the strength and direction of the relationship between the independent variables, perceived source quality and accessibility, and the dependent variable, frequency of source use, correlation analysis was conducted. Because the variables are ordinal, statistics texts advise calculating Spearman non-parametric correlations instead of the more common Pearson correlation (Bryman and Cramer 1997). For bivariate correlation, SPSS provides the option of handling missing data in two ways: pairwise and listwise. **Table 4** presents the list of Spearman correlations for information source quality, which represents the average of relevance and reliability scores for each information source. Both pairwise and list-wise correlations and their significance (two-tailed) are listed for each of the thirteen information sources, as well as the four types of information sources. Partial correlations are also provided to adjust for the effect of accessibility variables. To prevent too many correlations from being identified as significant in a large correlation matrix (13x13=169), applying the Bonferroni method (dividing the significance by the number of correlations) is recommended.

Table 4. Correlation Analysis of Perceived Source Quality and Frequency of Source Use

Information Source	Correlation (pairwise)	Sign (2 tail)	N	Correlation (listwise)	Sign (2 tail)	N	Correlation (partial)	Sign (2 tail)	N
External People Sources									
Customers	.63	.000	64	.63	.000	43	.66	.000	59
Business and professional associates	.40	.001	67	.42	.005	43	.35	.005	62
Competitors	.34	.009	59	.31	.042	43	.34	.011	53
External Non-People Sources									
World Wide Web	.55	.000	67	.49	.001	43	.52	.000	64
Computer-mediated communication	.68	.000	62	.66	.000	43	.66	.000	59
Mass media	.54	.000	67	.66	.000	43	.49	.000	64
External reports…	.34	.006	65	.24	.117	43	.40	.001	61
Internal People Sources									
Managers/Supervisors	.32	.010	63	.40	.007	43	.39	.002	60
Colleagues in the same group/dept	.53	.000	64	.66	.000	43	.57	.000	61
Colleagues in different group/dept	.33	.011	59	.45	.003	43	.30	.020	56
Internal Non-People Sources									
Intranet/Portal	.72	.000	56	.74	.000	43	.68	.000	52
Internal Memos	.74	.000	60	.76	.000	43	.77	.000	56
Internal library/information centre	.64	.000	57	.67	.000	43	.52	.000	53

Summary Table

Information Source Category	Correlation (pairwise)	Sign (2 tail)	N	Correlation (listwise)	Sign (2 tail)	N
External People Sources	.411	.001	67	.391	.002	61
External Non-People Sources	.444	.000	67	.431	.001	61
Internal People Sources	.392	.001	66	.374	.003	61
Internal Non-People Sources	**.707**	.000	61	**.707**	.000	61

All correlations were found to be significant, even when the Bonferroni calculation is taken into consideration. The partial correlations for source quality versus source usage are ranked from largest to smallest as follows: internal memos; intranet/portal; computer-mediated communication; customers; colleagues in the same group/department; internal library/information centre; World Wide Web; mass media; external reports and studies; periodicals and journals; managers/supervisors; business and professional associates; competitors, and colleagues in a different group/department. The largest magnitude correlation is .77, which is high, and the lowest correlation is .30, which is low. Note, the magnitude of the correlations is slightly smaller for the partial correlations compared to the correlations (pairwise and listwise), indicating a small influence of the other independent variable, source accessibility, on the relationship between source quality and usage under investigation.

When information sources are grouped in a typology of external-people, external non-people, internal people, and internal non-people sources by averaging the scores/ratings for sources within a group, correlation values are generally smaller, except for internal non-people sources. This would suggest substantial variability in correlation scores within a group, with the exception of internal non-people sources, which is indeed the case.

When the Spearman correlation matrix is generated for source *relevance* versus usage, all correlations (pairwise) are large (>0.80) and highly significant. The magnitude diminishes, considerably for some sources, when the listwise procedure is used, but several correlations are still of high magnitude and significant, as shown in Table 5.

Table 5. Correlation Analysis of Perceived Source Quality: Relevance and Frequency of Source Use

Information Source	Correlation (pairwise)	Sign (2 tail)	N	Correlation (listwise)	Sign (2 tail)	N
Customers	.88	.000	64	.58	.000	41
Business and professional associates	.83	.000	67	.40	.009	41
Competitors	.94	.000	59	.23	.067	41
World Wide Web	.89	.000	67	.49	.001	41
Computer-mediated communication	.91	.000	62	.67	.000	41
Mass media	.87	.000	66	.60	.000	41
External reports…	.90	.000	65	.35	.025	41
Managers/Supervisors	.92	.000	63	.43	.005	41
Colleagues in the same group/dept	.90	.000	65	.74	.000	41
Colleagues in different group/dept	.95	.000	60	.52	.001	41
Intranet/Portal	.95	.000	55	.77	.000	41
Internal Memos	.93	.000	60	.79	.000	41
Internal library/information centre	.90	.000	57	.77	.000	41

Summary Table

Information Source Category	Correlation (pairwise)	Sign (2 tail)	N	Correlation (listwise)	Sign (2 tail)	N
External People Sources	.452	.000	67	.429	.001	61
External Non-People Sources	.543	.000	67	.540	.000	61
Internal People Sources	.373	.002	66	.246	.056	61
Internal Non-People Sources	.735	.000	61	.415	.001	61

In contrast, when the corresponding correlation matrix is computed for source *reliability*, only a few modest size correlations are uncovered, as shown in Table 6 below. It would seem relevance is a better predictor of source usage than reliability.

Table 6. Correlation Analysis of Perceived Source Quality: Reliability and Frequency of Source Use

Information Source	Correlation (pairwise)	Sign (2 tail)	N	Correlation (listwise)	Sign (2 tail)	N
Customers	.56	.000	61	.59	.000	39
Business and professional associates	.28	.022	65	.38	.017	39
Competitors	.26	.052	56	.22	.189	39
World Wide Web	.38	.002	66	.37	.022	39
Computer-mediated communication	.55	.000	61	.54	.000	39
Mass media	.42	.000	66	.57	.000	39
External reports…	.12	.329	65	.002	.989	39
Managers/Supervisors	.24	.061	62	.301	.057	39
Colleagues in the same group/dept	.44	.000	63	.56	.000	39
Colleagues in different group/dept	.20	.137	57	.37	.021	39
Intranet/Portal	.53	.000	54	.54	.000	39
Internal Memos	.55	.000	58	.60	.000	39
Internal library/information centre	.41	.002	53	.27	.101	39

Summary Table

Information Source Category	Correlation (pairwise)	Sign (2 tail)	N	Correlation (listwise)	Sign (2 tail)	N
External People Sources	.31	.011	65	.32	.015	59
External Non-People Sources	.25	.040	66	.23	.080	59
Internal People Sources	.32	.009	65	.29	.024	59
Internal Non-People Sources	.46	.000	60	.46	.000	59

Comparing correlation (listwise) values for relevance and reliability, we see that for both attributes of source quality, there is a strong, positive relationship between them and source usage for these sources: internal memos, intranet/portal, colleagues in same department, computer-mediated communication, and mass media.

The study did not reveal a strong relationship between source accessibility and source usage. The correlation (pairwise) matrix for source accessibility (the average of the scores for the two attributes of accessibility) and source usage, shows only one modest size correlation for computer-mediated communication (correlation coefficient=.53, significance=.000) and one modest size correlation for internal library/information centre (correlation coefficient=0.32, significance=.015). When the relationship between source usage and time and effort, an attribute of source accessibility, is examined individually, only very low correlations (both positive and negative) are generated, none of which are significant. When the relationship between source usage and ease to get information, the second attribute of source accessibility, is examined, two modest size correlations are found, one for computer-mediated communication (correlation coefficient=0.61, significance=.000) and for internal library/information centre (correlation coefficient=.45, significance=.001). These findings suggest that one attribute of accessibility, ease to get information, accounts for the modest relationship between source accessibility and source usage for these two information sources, while the other attributes of accessibility, time and effort to contact source, does not influence source usage.

5 Regression Analysis

To explore the relationship between the two information source variables, perceived quality and accessibility, and source usage, and determine the relative importance of each variable, multiple regression analysis was conducted for each information source. Perceived source quality and accessibility are entered as the two independent variables, and frequency of source usage is the dependent variable. Results are shown in Table 7. For 6 sources, the regression models based on perceived source quality and accessibility were able to explain between 30 and 60 percent of the total variance in the frequency of source use. These 6 sources are: internal memos (58%), computer-mediated communication (55%), intranet/portal (44%), customers (42%), internal library/IC (34%), and colleagues in same department (32%). For another 2 sources, the World Wide Web and mass media, quality and accessibility accounted for 25% of the source use variance.

Table 7. Regression Analysis of Perceived Source Quality, Perceived Source Accessibility, and Frequency of Source Use

Information Source	Adjusted R^2	standardized B regression source quality	significance	standardized B regression source accessibility	significance
Customers	.421	.656	.000	.078	.430
Business and professional associates	.096	.352	.005	.008	.948
Competitors	.124	.338	.011	.163 (-)	.208
World Wide Web	.253	.560	.000	.148 (-)	.201
Computer-mediated communication	.546	.739	.000	.015	.891
Mass media	.250	.493	.000	.096	.382
External reports…	.142	.406	.001	.028	.812
Managers/Supervisors	.133	.412	.002	.203 (-)	.107
Colleagues in the same group/dept	.317	.614	.000	.102 (-)	.371
Colleagues in different group/dept	.063	.312	.020	.020 (-)	.878
Intranet/Portal	.444	.707	.000	.150 (-)	.160
Internal Memos	.578	.793	.000	.114 (-)	.206
Internal library/information centre	.343	.569	.000	.066	.604

For the first source, Customers, adjusted R square equals 0.421, which indicates less than half of the total variability is explained by the two independent variables. The standardized beta regression coefficient for source quality is 0.656 (significance=.000), while the standardized beta regression coefficient for source accessibility is 0.078 (significance=.430). This clearly indicates that source quality contributes the most to the relationship between source attributes and source usage. Adding computer and Web experience variables to the regression equation reveals that these variables contributes little to the regression equation. The same pattern is seen for all information sources: source quality contributes substantially more than source accessibility to the regression equation. The contribution of source accessibility to the regression is weakly positive for some sources, while for other sources it is weakly negative (however all the standardized betas are non-significant). Overall, the contribution of the two independent variables to the total variability in the regression equation varies greatly from source to source, from less than 10% for business and professional associates and colleagues in a different group/department to slightly more than 50% for computer-mediated communication.

6 Discussion

The strong relationship between perceived source quality and source usage is the most significant finding of this study. This conclusion runs counter to early, well known studies by Rosenberg (1967), Gertsberger and Allen (1968), and others which concluded that scientists and engineers selected sources based only on their accessibility. Surprisingly, the present study did not find a

significant relationship between source accessibility and source usage.

In evaluating the studies by Rosenberg, and Gertsberger and Allen, Orr (1970) observed that for many common needs, where only a small amount of 'good enough' information is required, these undemanding requirements can generally be satisfied by any of the types of sources ranked in the two studies. Under these circumstances, source selection might well be based on cost considerations only, since the perceived benefit would be roughly equal for all source types. Orr believed that the quality of the information is the most important consideration in selecting the information source.

Hardy (1982) also suggested that information users do not seek *only* to minimize costs by using the most accessible sources. In his study of personnel from the management arm of the US Forestry Service which included foresters, biologists, architects, hydrologists, engineers, and planners, the results do *not* support the finding that accessibility exclusively determines the frequency of source use. Instead, information seekers do evaluate sources on the basis of their costs and benefits. Although the majority of the weight in their decision goes to accessibility, the quality of the information obtained is also a significant factor.

Culnan (1983) found that the process of information acquisition is not entirely a function of perceived source accessibility. In her study of the use of nine information sources by professionals in the corporate headquarters of two large organizations (a bank and a manufacturing firm), the results show that information gathering requirements created by the complexity of an individual's job task may necessitate the use of less accessible sources.

Swanson (1987) investigated the use of ten management reports by 186 users in four organizations. The study found that the individual's use of an information channel or source can be explained in part by the individual's attitude or disposition towards that channel, and that the attributed information quality of a channel plays a significant role in this explanation. This conclusion, as Swanson noted, is opposite to that of the work of Allen (1977) which emphasized channel accessibility over quality.

Pinelli et al (1991) reported their nationwide survey of the information seeking behavior of US aerospace engineers and scientists sponsored by NASA and the US Department of Defense. The study investigated the influence of seven selection factors on the use of four information sources: US Government technical reports, conference papers, journal articles, and internal technical reports. Their data showed that accessibility does not appear to be the single most important overall independent variable. While accessibility does exert influence, *relevance* seems to be the single most important determinant of the overall extent to which US aerospace engineers and scientists use these sources. They conclude that the accessibility model may not be as pertinent in the 1990s (Pinelli et al 1991).

Auster & Choo (1993) found that source quality is the most important factor in explaining source use in environmental scanning by CEOs in two industries with high levels of perceived uncertainty. In the study by Choo, Detlor and Turnbull (2000) focusing on information technologists and corporate managers, source quality was significantly correlated with source use in the case of Customers, Competitors, External reports, Colleagues in same department, Internal memos, and Internal library. At the same time, source accessibility was significantly correlated with the use of Business associates, Mass media, External reports, and Internal library.

Our findings would indicate that women in IT professions have ready physical access to a multitude of print and electronic information sources in their workplace environment, including close physical proximity to a computer with high speed Internet access. The second measure of access, ease of retrieving information once the source has been contacted, includes a consideration of literacy and domain knowledge. Because the study sample includes primarily highly educated individuals, retrieving information, and reading and understanding it, may not present difficulties.

The significant relationship between source quality and usage can be attributed to the need for women in IT professions, and in all likelihood all IT professionals, irrespective of gender, to determine which information source, in the age of information overload, will provide them with the most relevant

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and reliable information for their IT information needs.

The high ratings for CMC on source quality measures, which is on par with ratings of relevance for managers/supervisors and colleagues in the same department, may surprise some, given the sometimes spotty reputation of CMC sources. However, participants' comments in the final section of the survey reveal their use of CMC is primarily restricted to moderated listservs. Because they are moderated, there is some degree of quality assurance. The use of this information source by women in IT professions may suggest CMC provides a means for this minority group of IT workers to obtain IT information from people outside their workplace, information that they consider to be as relevant as information obtained from their workplace superiors and colleagues. CMC could be considered as a surrogate interpersonal source. For women IT professionals who work on their own as consultants or web designers, CMC may additionally offer a connection to the broader IT community. Interview data on the use of CMC by women in IT professions will be presented in a future publication.

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