

Information Anxiety: Fact, Fable or Fallacy

John Girard¹ and Michael Allison²

¹Minot State University, Minot, ND, USA

²Touro University International, Cypress, CA, USA

john@johngirard.net

mallison@touro.edu

Abstract: The aim of this paper is to compare and contrast the findings of three recent empirical studies that examined the construct of information anxiety. The concept of anxiety created from information has been studied for hundreds of years; however, this paper views this complex relationship based on the foundation provided by Richard Wurman's book *Information Anxiety* (1989). The three studies explored the five subcomponents of information anxiety as described by Wurman: not understanding information; feeling overwhelmed by the amount of information to be understood; not knowing if certain information exists; not knowing where to find information; and knowing exactly where to find the information, but not having the key to access it. In order to gauge the level of information anxiety a survey instrument was designed using eight management scenarios suggested by Davenport and Prusak in *Working Knowledge* (1998). Four of the eight scenarios examine the creation of information from data and four scenarios focus on the transformation of information into knowledge. Of specific interest to these studies was the question *is there a difference between information overload and information anxiety*. In other words, is the issue simply one of quantity or do other information related challenges make a difference. To this end, the researchers sought to determine if respondents perceived a difference between information overload and the other components of information anxiety. The first of these studies determined that respondents reported a statistically significant difference between information overload and several other components while the second study's respondents did not report such a difference. The conflicting results begged the question: is information anxiety a fact, fiction, or fallacy? The third study reinforced the finding of the initial study suggesting information anxiety is a real organizational malady worthy of the attention of senior leaders. Clearly additional research is required to further refine the malady, its causes, and ways to combat its debilitating effects.

Keywords: information anxiety, knowledge management, information overload

1. Introduction

That in spacious knowledge there is much contristation, and that he that increaseth knowledge increaseth anxiety.

Sir Francis Bacon, 1605

The broad issue of information or knowledge anxiety and its effects on individuals and organizations has been studied since at least 1605. Possibly the first mention of this challenge was in Sir Francis Bacon's book entitled *The Advancement of Learning* (Bacon, 1915). It was nearly 400 years until the term information anxiety emerged in the popular press as the title of Richard Wurman's best-selling book (1989). Wurman defined *Information Anxiety* as "the black hole between data and knowledge," a definition that attracted the attention of many business leaders as many were struggling with challenges of organizational memory loss. As interesting as Wurman's hypothetical notion seemed, there was no empirical evidence to support his hypothesis. As a result, the concept was considered by some to be pure fiction, perhaps building upon Bacon's unsubstantiated claim of four centuries earlier, and relegated to the abyss of business hype.

Three recent empirical research projects have focused on the concept of information anxiety. The first project (Study A) examined the issue of knowledge management in a Canadian government setting (Girard, 2005a), the second project (Study B) considered high performance teams in the United States Air Force (Allison, 2006), while the third project (Study C) focused specifically on information anxiety of mid-level officers of the United States Air Force (Allison, 2008). Although the scopes of the three projects were very different, each study shared the common dependent variable of information anxiety.

The findings of Study A indicated that information anxiety was a distinct entity, quite different from the more commonly studied notion of information overload. This finding suggested information anxiety was not fiction, but rather a fact. The findings of Study B challenged Girard's findings and suggested that information anxiety was synonymous with information overload – such a discovery could suggest Study A's conclusion about information anxiety was a fallacy. However, the result of Study C reinforced the original findings. The aim of this paper is to compare and contrast the findings of the three studies with regard to the dependent variable - Information Anxiety. Of particular interest is the differentiation between information overload and information anxiety. Are these two terms synonymous or are they very different?

2. Literature review

As long as the centuries continue to unfold, the number of books will grow continually, and one can predict that a time will come when it will be almost as difficult to learn anything from books as from the direct study of the whole universe. It will be almost as convenient to search for some bit of truth concealed in nature as it will be to find it hidden away in an immense multitude of bound volumes.

Diderot & d'Alembert, 1755

2.1 Information anxiety

What is information anxiety? This is a difficult question because this construct has been pursued and studied under various headings (Bawden, 2001). Depending on context, where most modern researchers use the term "information," some discussions of information anxiety used terms such as "books," "ideas," "knowledge," "species," "things," or even "truth itself." The sheer number of these terms makes categorization and definition somewhat difficult. Should it be measured by something tangible such as the number of written texts, or is it more accurately determined by a more abstract measurement such as ideas or facts? Some believe it is better to dwell on the broader concepts rather than the specifics. In other words we should not focus too much on the individual trees, but rather on the larger forest (Rosenberg, 2003).

Observed in the aggregate, organizational information overload occurs when "the extent of perceived information overload is sufficiently widespread within an organization as to reduce the overall effectiveness of management operations" (Wilson, 2001: 113). In turn, "information overload occurs when the amount of input to a system exceeds its processing capacity" (Speier et al., 1999: 338). An important consideration in this research is that the type of information being received is unimportant; it is entirely reliant on the amount of information being processed. However, additional research has determined that quantity is not the only consideration when measuring information challenges. The work of Schick, Gordon, and Haka (1990) suggested that time is a factor. They point out that information concerns occur when the time to do a particular task is constrained to levels below what is required. This ultimately results in poor decision-making.

2.2 Wider categorization

Wurman introduced a novel notion whilst describing information anxiety by stating, "Information anxiety can afflict us at any level and is as likely to result from too much information as too little information" (Wurman, 1989: 44). This concept is essential to understand; as many researchers focus entirely on the idea of information overload and therefore deduce that the only challenge is too much information. Wurman notes that a major cause of information anxiety is the uncertainty surrounding the existence of a particular piece of information.

Based on recent knowledge management studies a wider classification appears more fitting. For example, the authors of Gartner Research's Information Overload Survey concluded there are four information issues affecting competition: siloed information; too much information; unindexed information; and ineffective searching procedures (Linden et al., 2002). In a second report, Linden (2001) suggests there are seven drivers of information overload: quantity; relevance; redundancy; information illiteracy; unqualified information; distraction by the obvious and the glossy; and business models struggling

The consideration of the wider categorization of this information challenge is supported by extensive research and is more pertinent than a study focused solely on some of the narrow definitions provided (Wurman, 1989; Kirsh, 2000; Linden, 2001; Linden et al., 2002). The focus on overload alone seems to imply a technological solution to reduce the quantity of information, perhaps by eliminating duplicate data. This may ease the size of the problem and may well be a part of the ultimate solution; however, the challenge is more complex and not merely an issue of quantity. Wurman, Kirsh, and Linden underscore other associated concerns, which from a management point of view are equally important. For example, simply reducing the quantity of information will do nothing to assist Wurman and Kirsh's concerns of not knowing where to find information.

Research has shown that information anxiety can occur under several different circumstances. Specifically, according to Wurman (1989), there are five broad scenarios which may create an atmosphere where information anxiety may occur. They are: not understanding information; feeling overwhelmed by the amount of information to be understood; not knowing if certain information exists; not knowing where to find information; and knowing exactly where to find the information, but not having the key to access it.

2.3 Task complexity and frequency

Further research has broken down the concept of information anxiety by analyzing the issues that further exacerbate the overall dilemma. The complexity of the task is often discussed as a contributing factor when studying information anxiety. While it is fairly intuitive, the fact that complex tasks create a heavier burden on people and systems has nonetheless been researched and the results support the intuition—subjects are more likely to develop information anxiety as the tasks they are completing become more complex (Baron, 1986; Wood, 1986). The work of Groff, Baron, and Moore (1983) has taken the research a step further by analyzing the effects of distractions on the level of information anxiety. Their research shows that, in relation to task complexity, the level of information anxiety in complex tasks increases as the quantity and force of distractions increases.

One recent study determined that although no relationship between the type of managerial task and the level of information anxiety existed, another relationship was discovered. A statistically significant negative relationship existed between frequency of task and the level of information anxiety reported. In other words as the task frequency increased there was a proportional reduction in the level of information anxiety reported. This important finding underscores that the frequency of task and not the type of task, is the predominant factor in the level of information anxiety (Girard, 2005b).

3. Research methodology

3.1 Overview of studies

The brevity of this paper precludes a detailed description of the research methodology; however, nor is it not central to this analysis. Each project was a traditional quantitative study based primarily on a survey instrument. The dependent variable for each study was Wurman's delineation of information anxiety, which may be graphically depicted as illustrated in Figure 1. Supported by considerable research, Wurman's conceptual framework includes five subcomponents (Linden, 2001; Linden et al., 2002; Kirsh, 2000). Collectively these five may gauge the level of information anxiety within a population. Each study asked respondents to rate each of the five elements of the dependent variable of Information Anxiety (IA). Based on their responses, each respondent was assigned an Information Anxiety score, which was the mathematical sum of the five components. This may be expressed mathematically as:

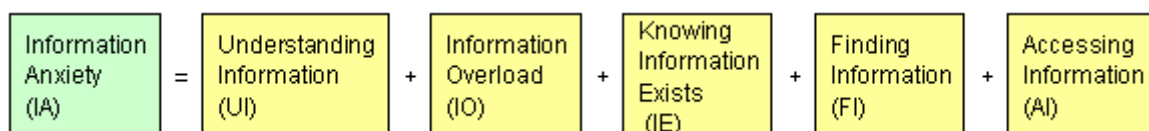


Figure 1: Information anxiety components

Study A analyzed the specific construct of information anxiety utilizing an empirical study of Canadian Public Service middle managers (Girard 2005a). Specifically, the study analyzed whether some types of middle managers reported lower levels of information anxiety as a result of knowledge management. A conclusion of the study was the finding that middle managers reported accessing information (a subcomponent of information anxiety) as a far more significant problem than information overload (also a subcomponent of information anxiety). Girard concluded this was a managerial problem and not simply a technical problem (Girard 2005a).

A limitation of Study A was the population under examination (Canadian Public Service middle managers) and therefore it was recommended that other researchers consider different populations. A subsequent project, Study B, was designed, which expanded upon Study A in many ways (Allison 2006). First, its setting was in the United States rather than Canada. Second, Study B measured information anxiety relative to quality improvement high performance team participation. Third, the sample was Air Force military personnel located at Luke Air Force Base in Phoenix, Arizona. Finally, Study B examined this construct in terms of its relationship to productivity, hierarchical position and education level. It was hoped that by exploring these new avenues of analysis, new boundaries could be pushed and further areas of research could be uncovered.

Study C built on the foundation of the two previous studies and was designed with a view to explaining some of the inconsistent findings of the first two studies (Allison 2008). Study C focused specifically on information anxiety with a sample that shared some characteristics from both of the previous studies. The sample for Study C was United State Air Force officers attending the Air Command and Staff College. The experience

and education of this group was similar to the sample of Study A, though the nationality and vocation of the sample mirrored that of Study B.

3.2 Management scenarios

The instrument for the dependent variable in each study included eight management scenarios (see Table 1 for an overview or Appendix A for more detail). The scenarios were based on Davenport and Prusak's (1998) definition of data, information, and knowledge combined with the activities associated with each term. According to Davenport and Prusak's operationalization, there are four major ways that managers may transform information into knowledge. This transformation may occur through comparison, consequences, connections, or conversation. Similarly, Davenport and Prusak contend that data may metamorphose into information through a series of activities that increases its value. These methods include contextualization, categorization, calculation, correcting, or condensing. Building on Davenport and Prusak's segmentation eight scenarios were developed as show in table 1.

Table 1: Management scenarios

Management scenarios focused on how respondents:
1. Compared information with previous information. 2. Determined the consequences or repercussions of information on decisions. 3. Considered how information connects or correlates to other information. 4. Through conversation, concluded what people think about the information. 5. Categorized the data by describing the breakdown or the essential components of the data 6. Calculated data (mathematically or statistically). 7. Corrected errors found in previously reported data. 8. Condensed data by providing a summary of the entire collection of data.
Based on segmentation in <i>Working Knowledge</i> (Davenport and Prusak, 1998)

For each of the eight management scenarios, the respondents were asked to answer five questions related to the subcomponents of Information Anxiety. Based on responses to the following statement; each participant was assigned a level of information anxiety.

Table 2: Dependent variable questions

How much do you agree/disagree with the following statements [based on the scenario described]?
1. I would not understand information required to complete tasks. 2. I would feel overwhelmed by the amount of information to be understood. 3. I would not know if certain information exists. 4. I would not know where to find information. 5. I would know exactly where to find the information, but I would not have the key to access it.

4. Analysis

4.1 Overview

For each of the eight scenarios contained in the survey instrument, respondents answered questions related to the five subcomponents using a five-point Likert scale where the higher score represents tasks that are more common (1 = strongly disagree; 2 = disagree; 3= neutral; 4 = agree; and 5 = strongly agree). Based on these responses, each subcomponent was assigned a numerical value, from which the ultimate value for Information Anxiety was derived (see Appendix B Tables 1, 2, 3).

Of particular note was the very low level of information anxiety reported in each study. When the means are converted to an equivalent five-point scale, where 1 indicates a very low level and 5 indicated a very high level, the low levels reported become obvious – see Figure 2. For example, means of 2.5 and below indicate the average respondent “disagreed” that the task appreciably contributed to information anxiety.

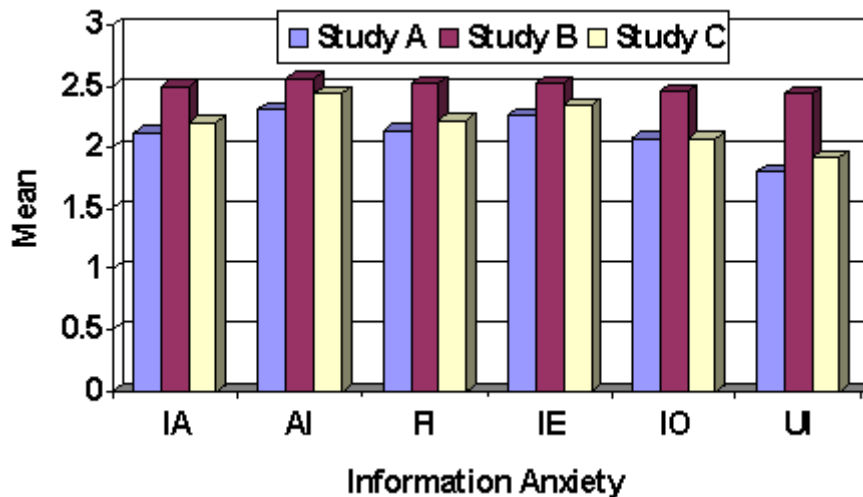


Figure 2: Information anxiety by component

4.2 Study A findings

In Study A, an analysis of the variance indicated that a significant difference existed between the components of Information Anxiety (see Appendix B Table 8). A one-factor ANOVA between the components was performed to determine whether there was a significant difference between their means. The F-statistic was significant at the .05 critical alpha level, $F(4,490) = 7.962$, $p = .0000$. Subsequent post-hoc least significant difference t-tests between group means revealed Understanding Information (UI) was significantly less than all other components (see Appendix B Table 9) and that Information Overload (IO) was significantly less than Accessing Information (AI) - defined as knowing exactly where to find the information, but not having the key to access it.

Table 3: Significant difference between components of information anxiety (Study A)

	AI	FI	IE	IO	UI
Accessing Information (AI)		No	No	Yes	Yes
Finding Information (FI)	No		No	No	Yes
Knowing Information Exists (IE)	No	No		No	Yes
Information Overload (IO)	Yes	No	No		Yes
Understanding Information (UI)	Yes	Yes	Yes	Yes	

This finding led Study A's author to conclude "As this was the first project to use the information anxiety instrument, one must not draw many conclusions from the raw values. Rather, one should consider the relative and significant order of the five components. Using information overload as the baseline, this project gauged how the other components compared to the well-understood phenomenon of information overload. Over time, it would be useful to refine the instrument and to perform a comparison between these data sets and others; however, at present, the central issue is the ordinal relationship of the elements" (Girard, 2005b: 76).

4.3 Study B findings

In Study B, the relative order of the components was very similar to those of Study A; however, an analysis of the variance indicated that a significant difference did not exist between the components of Information Anxiety (See Appendix B Table 10). The F-statistic was not significant at the .05 critical alpha level, $F(4,490) = 0.746$, $p = .561$. This discovery questioned the findings of the initial project. Given that both studies explored the issues of validity and reliability, it seemed prudent to hypothesize the cause of conflicting findings.

Several factors could explain the conflicting findings. First, the sampling techniques may have caused problems because both studies were based on convenience samples, which may not have been representative of their respective populations. Second, the samples were very different - Study A's sample contained survey participants from a variety of organizations compared to Study B's sample that focused on a single location and type of respondent. Third, related to the homogeneity/heterogeneity issue is one of organization type. Study A's sample were predominantly civilian union members while Study B's sample was composed entirely of Air Force personnel. Another major difference was education, Study A's sample was relatively well educated with 75.2% of respondents possessing at least a bachelor's degree compared to Study B where just 10.6% of respondents had earned a bachelor's degree. Finally, one study was conducted in Canada using middle managers and the other study was conducted in the USA using a large number of non-managers.

4.4 Study C findings

In Study C, the relative order of the components mirrored the findings of the previous two studies; however, an analysis of the variance indicated that a significant difference existed between the components of Information Anxiety (see Appendix B Table 11). Subsequent post-hoc least significant difference t-tests between group means revealed Understanding Information (UI) was significantly less than all other components except Information Overload (IO); that Information Overload (IO) was significantly less than Accessing Information (AI) and Finding Information (FI); and Knowing Information Exists (IE) was significantly less than Accessing Information (AI). Of particular interest is the similarity of the findings between Studies A and C.

Table 4: Significant difference between components of information anxiety (Study C)

	AI	FI	IE	IO	UI
Accessing Information (AI)		No	Yes	Yes	Yes
Finding Information (FI)	No		No	Yes	Yes
Knowing Information Exists (IE)	Yes	No		No	Yes
Information Overload (IO)	Yes	Yes	No		No
Understanding Information (UI)	Yes	Yes	Yes	No	

The results of Study C proved to be very enlightening when compared to these previous studies. With regard to the changes in the United States Air Force population, many of the conclusions drawn raise additional questions. Specifically, although the level of information anxiety dropped a statistically significant amount during a 2-year span, this may be attributable to many different reasons. Also, the fact that the Maxwell sample was composed entirely of officers who were much older and possessed a much higher degree of post-secondary education than the primarily enlisted sample at Luke may have caused the drop. Additionally, the Maxwell sample was comprised of personnel competitively selected to attend the Air Command and Staff College (a very selective advanced education program for promising officers). The same factors that led to their selection may, in fact, have mitigating effects on the levels of information anxiety they recognize and display.

Similarly, when the results of Study C are compared to Study A in order to measure the changes in society as a whole, further questions arise. Why are the levels relatively similar between the two studies? One explanation may again rest in the realm of education level. The education level of the Study C sample was very high, with a full 100% possessing at least a bachelor's degree. Likewise, the Study A sample also had a high level of post-secondary education, with 75.2% possessing at least a bachelor's degree. This is in contrast to the Study B sample, where only 10.6% of respondents possessed a bachelor's degree or higher. This is significant and may point to an area requiring further analysis and study.

5. Conclusion

The aim of this paper was to compare and contrast the findings of three recent empirical studies that examined information anxiety. Of most interest to the body of knowledge in the domain is the question: is there a difference between information anxiety and the more common concept of information overload?

Information anxiety is an intuitive fact of life in the modern workplace, but to what magnitude? The combined findings of these three studies indicate that information anxiety has remained relatively unchanged across society, though there is some evidence that the levels have dropped dramatically within the smaller population of the United States Air Forces. There is clear evidence to suggest that certain variables may affect the level of information anxiety, but to what extent is difficult to predict at this point. Understanding these variables could pay huge dividends in the development of approaches to deal with work-related concepts such as stress and job performance.

Findings of this research may be important to managers and leaders in both the public and private sector, but there is still much work to be accomplished. Future studies should try to explore this phenomenon from new perspectives and with regard to the many mitigating factors that may impact its development. Future research should examine additional samples to ensure the effects measured in this study are applicable to the wider population. Also, more analysis should be done to develop ways to mitigate this phenomenon by creating experimental designs that allow the introduction of outside factors. Through the use of control groups, these outside factors could then be measured to determine if they have any impact on the levels of information anxiety. Research should also explore the effects of information anxiety in the workplace. Does it impact output, production, or finances? Can it lead to increased stress and physical problems? These questions require researchers with a strong background in the social sciences and a full understanding of the physical, emotional, and psychological impacts of this problem. It is necessary for researchers in the fields of social and physical sciences, economics and information technologies to continue to explore this issue in the hope of developing a greater understanding.

At this point it is not possible to pronounce whether information anxiety is a fact, fiction, or fallacy. Clearly there is some empirical evidence that the construct developed by Wurman has merit; however, the conflicting results of these studies mean that more research is required. Ironically after more than 400 years of learning we may not be any further forward than when Bacon wrote *That in spacious knowledge there is much contristation, and that he that increaseth knowledge increaseth anxiety.*

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Appendix A – Survey instrument scenarios

This section of the survey includes eight groups of questions based on the type of tasks you complete on a daily basis. As there are no correct or incorrect responses, please simply respond with the answer you feel most closely resembles your real world response.

The procedure for each group of questions will be the same. First, a brief scenario is presented which sets the scene for a group of questions. Read the scenario carefully and then respond to the questions. For each scenario, a general picture will be described, but you should think of a real life scenario. As an example in the first scenario, you are asked to summarize data into a more concise form. Think of a real world example of this sort of task and then answer the questions. For example, if you work in a training area, perhaps you have been asked to summarize data including the number of people that have completed various courses. Perhaps it is something more generic, like counting the number of employees that have missed one or more days due to recurring training. If you are a mechanic, perhaps the task is summarizing the number of aircraft you have worked on over the past six months.

Be sure to answer each of the questions under each scenario. For each question, you will use a scale from 1 to 5 to respond, where 1 is Strongly Disagree, 3 is Neutral, and 5 is Strongly Agree as shown below.

Strongly Disagree Disagree Neutral Agree Strongly Agree

1 2 3 4 5

1. Your immediate supervisor asks you to compile a report that summarizes data into a more concise form. In this case, your boss asks you to collect the data for the past six months and to develop a one page report. How much do you agree/disagree with the following statements?

	Strongly Disagree				Strongly Agree
	1	2	3	4	5
I routinely complete tasks similar to this scenario.	☐	☐	☐	☐	☐
I would not understand the data required to complete this task.	☐	☐	☐	☐	☐
I would feel overwhelmed by the amount of data to be understood to complete this task	☐	☐	☐	☐	☐
I would not know if certain data necessary for this task exists.	☐	☐	☐	☐	☐
I would not know where to find data necessary for this task.	☐	☐	☐	☐	☐
I would know exactly where to find data, but I would not have the key to access it.	☐	☐	☐	☐	☐

(Optional) Please describe an interesting success story or challenge that you have experienced while completing a task similar to this scenario.

2. Your boss passes you a report created by another organization and states that s/he thinks the report contains errors. S/he asks you to review the original data and make the necessary corrections. How much do you agree/disagree with the following statements?

	Strongly Disagree				Strongly Agree	
	1	2	3	4	5	
I routinely complete tasks similar to this scenario.	☐	☐	☐	☐	☐	
I would not understand the data required to complete this task.	☐	☐	☐	☐	☐	
I would feel overwhelmed by the amount of data to be understood to complete this task	☐	☐	☐	☐	☐	
I would not know if certain data necessary for this task exists.	☐	☐	☐	☐	☐	
I would not know where to find data necessary for this task.	☐	☐	☐	☐	☐	
I would know exactly where to find data, but I would not have the key to access it.	☐	☐	☐	☐	☐	

(Optional) Please describe an interesting success story or challenge that you have experienced while completing a task similar to this scenario.

3. Your manager sends you an e-mail asking you to develop a report that categorizes data for your organization over the last year. How much do you agree/disagree with the following statements?

	Strongly Disagree				Strongly Agree	
	1	2	3	4	5	
I routinely complete tasks similar to this scenario.	☐	☐	☐	☐	☐	
I would not understand the data required to complete this task.	☐	☐	☐	☐	☐	
I would feel overwhelmed by the amount of data to be understood to complete this task	☐	☐	☐	☐	☐	
I would not know if certain data necessary for this task exists.	☐	☐	☐	☐	☐	
I would not know where to find data necessary for this task.	☐	☐	☐	☐	☐	
I would know exactly where to find data, but I would not have the key to access it.	☐	☐	☐	☐	☐	

(Optional) Please describe an interesting success story or challenge that you have experienced while completing a task similar to this scenario.

4. This time your superior asks you to analyze some data mathematically or statistically. You must find the relevant data and then create a one page report which summarizes your calculations. How much do you agree/disagree with the following statements?

	Strongly Disagree				Strongly Agree
	1	2	3	4	5
I routinely complete tasks similar to this scenario.	☐	☐	☐	☐	☐
I would not understand the data required to complete this task.	☐	☐	☐	☐	☐
I would feel overwhelmed by the amount of data to be understood to complete this task	☐	☐	☐	☐	☐
I would not know if certain data necessary for this task exists.	☐	☐	☐	☐	☐
I would not know where to find data necessary for this task.	☐	☐	☐	☐	☐
I would know exactly where to find data, but I would not have the key to access it.	☐	☐	☐	☐	☐

(Optional) Please describe an interesting success story or challenge that you have experienced while completing a task similar to this scenario.

5. Your immediate supervisor asks you to compare one report with a similar report from another organization. In order to complete the comparison you must first verify the original data. How much do you agree/disagree with the following statements?

	Strongly Disagree				Strongly Agree
	1	2	3	4	5
I routinely complete tasks similar to this scenario.	☐	☐	☐	☐	☐
I would not understand the data required to complete this task.	☐	☐	☐	☐	☐
I would feel overwhelmed by the amount of data to be understood to complete this task	☐	☐	☐	☐	☐
I would not know if certain data necessary for this task exists.	☐	☐	☐	☐	☐
I would not know where to find data necessary for this task.	☐	☐	☐	☐	☐
I would know exactly where to find data, but I would not have the key to access it.	☐	☐	☐	☐	☐

(Optional) Please describe an interesting success story or challenge that you have experienced while completing a task similar to this scenario.

6. Your boss passes you a report that indicates some changes in some sort of information since last year and asks you to develop a report that explains the consequences of the changes. You decide that you should review the original information before considering the consequences. How much do you agree/disagree with the following statements?

	Strongly Disagree				Strongly Agree
	1	2	3	4	5
I routinely complete tasks similar to this scenario.	☐	☐	☐	☐	☐
I would not understand the data required to complete this task.	☐	☐	☐	☐	☐
I would feel overwhelmed by the amount of data to be understood to complete this task	☐	☐	☐	☐	☐
I would not know if certain data necessary for this task exists.	☐	☐	☐	☐	☐
I would not know where to find data necessary for this task.	☐	☐	☐	☐	☐
I would know exactly where to find data, but I would not have the key to access it.	☐	☐	☐	☐	☐

(Optional) Please describe an interesting success story or challenge that you have experienced while completing a task similar to this scenario.

7. Your superior gives you two summary reports and asks you to explain how one connects to the other. For example, Report 1 is about employee absenteeism and Report 2 is about client satisfaction. Before responding you decide to review the original information. How much do you agree/disagree with the following statements?

	Strongly Disagree				Strongly Agree
	1	2	3	4	5
I routinely complete tasks similar to this scenario	☐	☐	☐	☐	☐
I would not understand the data required to complete this task.	☐	☐	☐	☐	☐
I would feel overwhelmed by the amount of data to be understood to complete this task	☐	☐	☐	☐	☐
I would not know if certain data necessary for this task exists.	☐	☐	☐	☐	☐
I would not know where to find data necessary for this task.	☐	☐	☐	☐	☐
I would know exactly where to find data, but I would not have the key to access it.	☐	☐	☐	☐	☐

(Optional) Please describe an interesting success story or challenge that you have experienced while completing a task similar to this scenario.

8. Your immediate supervisor tells you about a proposed change within your organization. S/he asks you to speak with others in your organization to determine the implications of the change. How much do you agree/disagree with the following statements?

	Strongly Disagree				Strongly Agree
	1	2	3	4	5
I routinely complete tasks similar to this scenario.	☐	☐	☐	☐	☐
I would not understand the data required to complete this task.	☐	☐	☐	☐	☐
I would feel overwhelmed by the amount of data to be understood to complete this task	☐	☐	☐	☐	☐
I would not know if certain data necessary for this task exists.	☐	☐	☐	☐	☐
I would not know where to find data necessary for this task.	☐	☐	☐	☐	☐
I would know exactly where to find data, but I would not have the key to access it.	☐	☐	☐	☐	☐

(Optional) Please describe an interesting success story or challenge that you have experienced while completing a task similar to this scenario.

Appendix B – Statistical data

Table 5: Information anxiety descriptive statistics – Study A

Variable	Mean	SD	Variance	Median	Total
DV - Information Anxiety (IA)	84.72	22.94	526.02	84	99
DV* - Accessing Information (AI)	18.51	6.15	37.86	17	99
DV* - Information Exists (IE)	18.11	5.83	34.02	18	99
DV* - Finding Information (FI)	17.14	5.53	30.53	17	99
DV* - Information Overload (IO)	16.56	6.30	39.74	16	99
DV* - Understanding Information (UI)	14.40	4.49	19.92	14	99

* = component of Dependent Variable - Information Anxiety

Table 6: Information anxiety descriptive statistics – Study B

Variable	Mean	SD	Variance	Median	Total
DV - Information Anxiety (IA)	99.95	28.19	794.71	108	202
DV* - Accessing Information (AI)	20.54	6.22	38.65	22	202
DV* - Information Exists (IE)	20.03	6.60	43.54	22	202
DV* - Finding Information (FI)	20.14	6.61	43.64	22	202
DV* - Information Overload (IO)	19.65	6.70	44.93	21	202
DV* - Understanding Information (UI)	19.57	6.20	38.43	21	202

* = component of Dependent Variable - Information Anxiety

Table 7: Information anxiety descriptive statistics – Study C

Variable	Mean	SD	Variance	Median	Total
DV - Information Anxiety (IA)	87.92	17.74	314.88	86	61
DV* - Accessing Information (AI)	19.56	5.03	25.25	20	61
DV* - Information Exists (IE)	18.69	5.08	25.85	18	61
DV* - Finding Information (FI)	17.77	4.39	19.25	18	61
DV* - Information Overload (IO)	16.54	5.09	25.89	16	61
DV* - Understanding Information (UI)	15.36	4.00	16.00	15	61

* = component of Dependent Variable - Information Anxiety

Table 8: Analysis of variance for information anxiety – Girard Study

Component	N	Mean	SD		
Understanding Information (UI)	99	14.404	4.486		
Information Overload (IO)	99	16.556	6.304		
Information Exists (IE)	99	18.111	5.833		
Finding Information (FI)	99	17.141	5.525		
Accessing Information (AI)	99	18.505	6.153		
Source of Variation	DF	Sum of Squares	Mean Squares	F-Ratio	Significance Level
A	4	1033.588	258.397	7.962	0.000
Error	490	15902.828	32.455		
Total	494	16936.416			

Table 9: Post-hoc least significant difference t-tests between group means - Values of p are for a two-tailed test. Note: Statistics are shown only if p is less than or equal to .05

t(196)=2.657, p=0.009	Understanding Information - Information Overload
t(196)=4.578, p=0.000	Understanding Information - Information Exists
t(196)=3.381, p=0.001	Understanding Information - Finding Information
t(196)=5.065, p=0.000	Understanding Information - Accessing Information
t(196)=2.408, p=0.017	Information Overload - Accessing Information

Table 10: Analysis of Variance for Information Anxiety – Study B

Information Anxiety Component	N	Mean	SD		
Understanding Information (UI)	202	19.57	6.20		
Information Overload (IO)	202	19.65	6.70		
Information Exists (IE)	202	20.03	6.60		
Finding Information (FI)	202	20.14	6.61		
Accessing Information (AI)	202	20.54	6.22		
Source of Variation	DF	Sum of Squares	Mean Squares	F-Ratio	Significance Level
A	4	124.941	31.235	0.746	0.561
Error	490	42063.371	41.854		
Total	494	42188.312			

Table 11: Analysis of variance for information anxiety – Study C

Component	N	Mean	SD		
Understanding Information (UI)	61	15.36	4.00		
Information Overload (IO)	61	16.54	5.09		
Information Exists (IE)	61	17.77	4.39		
Finding Information (FI)	61	18.69	5.08		
Accessing Information (AI)	61	19.56	5.03		
Source of Variation	DF	Sum of Squares	Mean Squares	F-Ratio	Significance Level
A	4	683.110	170.777	7.604	0.0000
Error	300	6737.250	22.458		
Total	304	7420.360			

Table 12: Post-hoc least significant difference t-tests between group means - Values of p are for a two-tailed test. Note: Statistics are shown only if p is less than or equal to .05 (^ indicates similar finding in Study A).

t(120)=2.809, p=0.006	Understanding Information - Information Exists ^
t(120)=3.881, p=0.000	Understanding Information - Finding Information ^
t(120)=4.895, p=0.000	Understanding Information - Accessing Information ^
t(120)=3.519, p=0.001	Information Overload - Accessing Information ^
t(120)=2.086, p=0.039	Information Exists – Accessing Information
t(120)=2.506, p=0.014	Information Overload – Finding Information

