"Of Making Many Books There Is No End, And Much Study Wearies the Body"
Ecclesiastes 12:12

Lonnie V. Roberts

MLIS 7800 Capstone
Elaine Yontz, Ph.D.
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Picture a point in the future where an anthropologist is conducting research on the remains of a lost civilization. His research reveals that the lost civilization's alphabet was reduced mostly to consonants in an effort to shrink the volume of information produced. As the amount of information continued to grow, technology was able to keep up. With the technological advances made by the civilization, all books (called "Bx") were eventually stored in a single building for the whole civilization. The building was twenty-five miles square and two miles high and was called a "liebury (lbry)".

The civilization's technology advanced to the point where all information and knowledge was eventually reduced to a drawer sized box through very advanced subatomic processes. The only problem was that access to the information required a very complicated index and bibliography. As information continued to grow and be stored in the drawer, the indexes and bibliographies grew exponentially. Soon there was Indexes to Indexes to Indexes (written I^3). Index runs were stored in files and files in catalogs. Information continued to grow and soon the indexes had to have their own drawers. Cities and eventually planets were created to house the growing collection of drawers.

In time, a case of circular reference was discovered. The civilization was forced to refer to the very first drawer to correct the problem. Unfortunately, the circular reference problem made locating the first drawer impossible. The anthropologist discovers that the civilization collapsed while trying to locate the first drawer. Imagine a civilization collapsing because it has so much information that it cannot catalogue and retrieve it. Picture the death certificate reading, "Cause of death – INFORMATION OVERLOAD."

The story plot you have just read is, of course, fiction – science fiction to be precise. It is a short story written by Hal Draper and first published in 1961. He titled the story, "MS Fnd in a

Lbry." The catch is that the lost civilization is ours and the anthropologist is an alien. Could this really happen, what is "information overload?"

Information overload can mean several things. The online encyclopedia Wikipedia defines it as "having too much information to make a decision." Nelson (1994) defines it as "the inability to extract needed knowledge from an immense quantity of information." Allen and Wilson (2003) explain that it is "a perception on the part of the individual that the flows of information associated with work tasks is greater than can be managed effectively." In these three definitions alone, we see that information overload can be "too much information," "the inability to extract," and "a perception." Butcher (Edmunds and Morris, 2000) added another definition – "burdened with a large supply of unsolicited information, some of which may be relevant." Now, information overload becomes a "burden."

Some writers do not even agree that information overload exists. Meadow and Yuan (Edmunds and Morris, 2000) argue that for something to be information, someone has to actually receive it and understand it. Their position is that it is possible to have data overload, but not information overload. That seems to be a play on words, so for this paper, I will not distinguish between the two terms. Wurman (2000) does not consider information overload to be a real condition, "but an obscured attempt at understanding the emotions, frustrations, and bewilderment many of us feel often." His argument is that people cannot absorb any more information than their brain is able to handle and it is therefore impossible to overload a brain with information. I believe the "emotions, frustrations, and bewilderment" are symptoms of a condition. That condition has a name – information overload. It does not necessarily manifest itself mentally as we shall see.

There are far more articles and books that talk about information overload and acknowledge its existence than articles and books that do not. Some refer to it by names such as data smog, data glut, information dilemma, information shock, infoglut, and others. Regardless of what it is called, based on the number of writings I found, there is a perception "out there" that information overload does exist.

"Information overload" or another of its names appeared in the title of 60% of the articles and books I read while conducting research for this paper. The remaining 40%, while not including it in their titles, either specifically mention it or allude to it in their content. Rather than defining information overload, most writers focus their attention on its causes and effects. The fact that so many people write about information overload confirms that it exists or at least is perceived to exist. So let us look now at some of the causes of information overload.

<u>Too Much Information</u>

In our kitchen, we have one cabinet in which we keep all of our spices on a revolving rack. This rack is supposed to make it easier to store, find, and retrieve spices. Over the Thanksgiving holiday, I walked into the kitchen and my wife had all of the spices out of the cabinet and on the kitchen counter. The counter was covered with spice containers. I asked her what she was looking for and she replied in a rather aggravated tone, "Nothing. I was just trying to figure out what is here. There was so much in this cabinet that I did not know what was there and I was having trouble finding what I needed when I needed it." I quickly counted eight containers of cloves, five of cinnamon, four of red pepper, five of garlic, three of chili powder, and at that point I stopped counting. I was afraid I would not be able to remember all of this before I could find paper and pen to write it down.

So it is with information today. We are often faced with so much information that we cannot find what we want or we forget what we have and begin to feel overwhelmed by it all. Consider these figures from a report prepared by UC Berkeley's School of Information Management and Systems entitled "How Much Information? 2003:"

- Five exabytes of new information was produced in 2002 by print, film, magnetic, and optical storage media. Five exabytes is equal in size to half a million libraries the size of the Library of Congress' print collections.
- The World Wide Web has about 170 terabytes of information. This is equal to seventeen libraries the size of the Library of Congress' print collections.
- Information transmitted through electronic flows (telephone, radio, TV, and the Internet) totals about 17.7 exabytes each year.
- There is almost 800 MB of recorded information produced per person per year. That is equal to almost 30 feet of books.

How many results did you get on your last Google search? On December 1, 2005, I did a search for information overload and got 10,800,000 results. When I put information overload in quotes, I got only 1,940,000 results. It is physically and mentally impossible for me to look at all of those results. And once I start looking at it, at what point do I determine that I have enough information to reach a decision or support my position on an issue? "The endless analysis is so overwhelming, it is difficult to know how and when to decide" (Shenk, 1997).

<u>The Demand for Information</u>

We live today in what many call the Information Society. "It has been argued that we are entering a new global information economy where information stands not only as the symbol for our age but is the driving force behind the transformation of our society" (Allen and Wilson, 2003). Only 4% of U.S. workers handled information in 1850; now most do and information processing accounts for more than half of our country's national product (Shenk, 1997).

With bosses demanding more and more information in the form of reports, summaries, white papers, etc. it is no wonder workers today feel overloaded. We all want to please our boss

and give him or her the most and best information we can. As a result, "most people harbor a lingering belief that even more relevant information lies somewhere outside and if found will save having to duplicate effort" (Kirsh, 2000).

Allen and Wilson (2003) identify the stress caused by this demand as a cause of information overload. Their argument is that this type of demand places workers' jobs in jeopardy, increases their workload, and "leads to information behavior that creates overload." I view the stress as a by-product of the demand for information and therefore do not feel it deserves separate discussion. Regardless, the demand for more and more information (and the stress it may cause) contributes to information overload.

Richard Saul Wurman points out in his book, "Information Anxiety," that society's solution for problems has usually been "more". When roads become crowded, people demand more roads. When crime goes up, people demand more laws and law enforcement personnel. It seems that the more information we have, the more we demand (Miller, K. A., 2004).

<u>A Lack of Useful and Valid Information</u>

"A thread that runs through the literature is that, although there is an abundance of information, it is often difficult to obtain useful and relevant information among the vast volumes of information" (Edmunds and Morris, 2000).

Several months ago, our library staff was out for various reasons and I was "filling in." Our college allows members of the general public to use our library computers as long as they understand that our students have to have priority. On this particular day, a gentleman came in and wanted to use our computers to research some topics for his daughter. He indicated that he was familiar with researching topics on the Internet (he usually did it at the public library, but they were having computer problems and referred him to us). I asked if he was familiar with

GALILEO and he was not. After showing him that resource, I left him to his work. After about 30 – 45 minutes he came up to me with a stack of pages he had printed and thanked me for the help. I asked if he found everything he needed and he said he found everything he needed off the Internet and did not have to use GALILEO. As we talked further, he began to show me the information he had printed. Probably 75% of what he had was, in my opinion, worthless and not from a valid and authoritative source. As I explained this to him, he made a comment that I can still remember very clearly. He said, "I thought everything on the Internet was true and OK to use for references. You mean nobody checks this stuff out before allowing it on the Internet?"

Anyone can post information on the Web. As Smith (1998) put it, "the online world is a vast untamed frontier, with outlaws, geniuses, entrepreneurs and serious scholars." Because of that, some people often have a hard time finding diamonds among all the coal. "Effort(s) to cope with the uncertain quality and relevance of our information supply" result in overload (Kirsh, 2000).

<div align="center">Power and Importance</div>

Information is power. A person with the right information can open doors, answer questions, impress the boss, solve problems, and feel important. Many times I have sat in meetings where someone's point of view prevailed because they had the right information at the right time. This desire to always have the right piece of information can lead to someone experiencing information overload.

It can also lead to others experiencing overload. Do you know someone who is constantly forwarding emails that contain the latest news, funny or inspirational stories, urban legends, etc.? At some time or other we have all experienced the feeling of wanting to be the first to share news or a story. It makes us feel important.

The problem with doing this is that it may cause someone else to experience information overload. I was recently out of the office attending a conference in Kansas City and was not able to check my email while there. I was gone for four days. Between work and home, I received over two hundred emails while I was away. Many of them were of the nature described here. They were from well intended people who felt that I needed to see this piece of information, read this story, or be enlightened with these facts. A lot of the emails were nothing but spam.

How does one know if he or she is experiencing information overload? What are the symptoms or effects of information overload? Most literature tends to focus on the effects; so let us now turn our attention to the effects of information overload.

<u>Lack of Productivity</u>

In a survey by Reuters, 38 percent of managers said that they wasted substantial amounts of time looking for information (Allen and Wilson, 2003). With the amount of information available, it often takes longer to find the relevant information needed for decision making. "With more research possibilities opening up, processing and distilling what really matters from the mass of information found requires more time" (Ojala, 2004). As a result, less work gets accomplished and productivity suffers. The Reuters' survey also revealed that 43 percent felt that decisions were delayed or adversely affected and 47 percent felt distracted from their primary tasks (Allen and Wilson, 2003). At his 2005 annual conference for CEOs, Bill Gates said, "Information overload is becoming a serious drag on productivity" (Gillespie, 2005).

<u>Stress</u>

Just as stress can be a possible cause of information overload, it can also be an effect. Stress is usually manifested in two ways.

(1) Physical Stress: Forty-two percent of the respondents in the Reuters' survey identified ill health as an effect of information overload (Allen and Wilson, 2003). Symptoms include indigestion, heart problems, and hypertension (Murray, 1998). The psychologist David Lewis analyzed the Reuter survey results and coined the term "Information Fatigue Syndrome" to describe the symptoms (Shenk, 1997). These symptoms are brought on by the stress one faces when dealing with information overload. I know when I got back from Kansas City and had over two hundred emails; I definitely felt "stressed out." I got over my stress very quickly using the delete key. But imagine have to deal with that amount of information on a regular or daily basis.

(2) Emotional stress: Just as stress can manifest itself through physical symptoms, it can also manifest itself through emotional symptoms. Those symptoms can include tension with co-workers, a decrease in social activities, and a general and constant feeling of tiredness. Respondents in the Reuters' survey reported feeling all of these as a result of information overload (Allen and Wilson, 2003).

<div align="center">Information Anxiety</div>

"Information anxiety is produced by the ever-widening gap between what we understand and what we think we should understand. It happens when information doesn't tell us what we want to know" (Wurman, 2000). With all the information that is available, we believe the answers we seek should be there. When we do not find them we become anxious. We feel as though we are not doing our job.

Information anxiety can also be produced when we believe the information we need is there and being controlled by someone who denies us access (Wurman, 2000). As a result, we become frustrated and anxious.

A third aspect of information anxiety is that it can be "a pervasive fear that we are about to be overwhelmed by the very material we need to master in order to function in this world" (Wurman, 2000). The fear is that by not mastering it, we become failures and disappoint those who are depending on us.

<center>Memory Loss</center>

If I tell my wife that I am going to Wal-Mart and she asks me to pick up one item for her, I usually have no problem remembering to do so. If, however, she names five or more items and I do not write them down, I inevitability find myself wondering around Wal-Mart trying to remember everything it was that she wanted. "The more things there are on a list to remember or to learn, the lower the probability that you'll remember any one of them" (Shenk, 1997). Remember, I had to stop counting the spices on our kitchen cabinet before I forgot what I had already counted.

<center>Addiction</center>

K. A. Miller (2004) identifies six reasons why too much information can be addictive. Just like stress, many of these could also be causes of information overload. People can become addicted to the control (1) and influence (2) information can give them. Other people just like to learn (3). They feel that as long as the information is there, they need to learn all they can whether what they learn is relevant or not. Money (4) is another reason too much information can be addictive. "The careers that pay best generally are those in which you hold information that other people clearly need but can't readily get without you" (Miller, K. A., 2004). Power (5) is another one that shows up as a cause and effect. The more you see that information gives you power, the more you want. Finally, the speed (6) at which information flows can be addictive. The amount of information available is growing faster and faster. The faster information gets

out, the more important it is. The more important it is, the more excitement there is. The more

excitement we experience, the greater the adrenaline rush. As K. A. Miller (2004) puts it,

"Speed = importance. Speed = excitement. Speed = adrenaline rush." The more we have, the

more we want. "Like most addictive substances, information helps us but can then become

overwhelming" (Miller, K. A., 2004).

<u>Infobesity</u>

Finally, let's look at infobesity. In today's society, obesity has become a major dietary

concern. Society's "super-size it" mentality with fast foods and the abundance of "junk" foods

have produced a generation of people who live off of this type of sustenance. Their diets are

lacking in nutritious qualities and as a result, many become obese and suffer health problems.

"James Morris, dean of the School of Computer Science at Carnegie Mellon University, has

coined the term 'infobesity,' which nicely describes . . . a junk-information diet, consisting of

overwhelming amounts of low-quality material that is hard to digest and leads to research papers

of equally low quality" (Bell, 2004). The copious amount of information that is available

"seduces us into ingesting too much, just like food" (Morris, 2003). As a result, most of the

information we digest has no nutritious value.

When you are sick and go to the doctor, he or she usually identifies your illness by its

symptoms or effects and then gives you a prescription to cure the symptoms and thus the illness.

But how do we cure information overload? Is there a "miracle drug" that can be prescribed?

Almost all writers I read acknowledge that there is no one prescription that can cure information

overload. It will most likely take a combination of several. Let's explore some of these "cures."

Technological Cures

Gates (2005) talks about several "promising technologies" on the horizon. He mentions

nine areas in which software technology will help with information overload.

1. "Improving personal productivity:" New software will be able to learn from the way

    you work, understand it, and help you set priorities.

2. "Pattern recognition and adaptive filtering:" As the new software learns your

    preferences, it will be able to "make inferences" and give you information you need.

3. "Unified communication:" Communication options will be unified in one view.

4. "Presence:" "Presence information connects people and their schedules to documents

    and workflow."

5. "Team collaboration:" New tools will connect workers and automate workflow

    among everyone.

6. "Optimizing supply chains:" Businesses will be able to seamlessly share information

    and processes and develop supply chains across organizations.

7. "Finding the right information:" Pattern recognition will organize information and

    allow documents to be queried intuitively.

8. "Spotting trends for business intelligence:" Highly developed software will be able to

    sort through data and identify trends that human analysts might miss.

9. "Insights and structured workflow:" Problems and trends will be recognized and

    routed to appropriate personnel for resolution.

Another technology that is available now is called RSS. RSS "has come to be aptly

defined as Really Simple Syndication" (Miller, R., 2004). RSS provides users the opportunity to

identify and receive specific information through an RSS aggregator. Users can identify specific

web sites and automatically receive new updates and information posted to those sites. "But its usefulness is limited. RSS can't send information to people who haven't asked for it. And it isn't of much use for a Web site that doesn't change very often" (Carnevale, 2004).

<div align="center">Human Cures</div>

Technology cannot cure information overload by itself. Although technology will play an important role in managing information, it still boils down to the human factor. Most writers on this subject identify cures that require human intervention. Chin (2005) states that information overload "is a human problem that needs a human solution." As the cartoon character Pogo once said, "We have met the enemy and he is us!" The cure for information overload must begin with the individual. What follows is a summary of the various "human cures" found in the literature I researched.

1. Self-examination. Determine if there is a problem. Examine your life – personal and professional. Do you see signs or symptoms of information overload? If so, acknowledge the problem and commit to addressing it.

2. Develop a strategy. Through strategic planning or personal development, identify what your major goals are and focus on those goals. Identify four or five information resource areas that can help you reach your goals.

3. Prioritize and focus. After identifying the information resources you need, focus your attention primarily on those areas. Make those areas your priority and examine other information areas only as time permits. Filter out those areas you do not need. This will require self-control and a realization and acceptance that you don't have to know everything.

4. Promote training and education. Learn how to manage new technology, develop effective search techniques, and identify valid sources of information. Encourage others to do the same.

5. Practice good information behavior. Distribute information you have or receive according to need. Do not send everything to everyone on your list unless everyone needs it.

6. Ask. Do not be afraid to seek help. Wurman (2000) reminds us that librarians find information for a living.

The six practices listed above are common throughout the literature. Some writers encourage additional actions. Shenk (1997) encourages people to occasionally clean their system with a "data-fast." Miller (2004) suggests that people take "an info-tech Sabbath." Both approaches involve turning off computers, e-mails, cell phones, faxes, etc. and simply resting from gathering information on a regular basis.

Edmunds and Morris (2000) envision businesses and industries hiring "specialists in information handling to carry out the acquisition of relevant information-processing and packaging the information needed as appropriate." Sounds like a job for a librarian or maybe an archivist.

Just as there is often no one specific cause of information overload, there is also no one specific cure. It may take a combination of several points mentioned above. The key is finding what works for you.

The final area that I want to examine is the role of libraries and librarians in information overload. The Roman philosopher Seneca once wrote, "What is the use of having countless books and libraries, whose titles their owners can scarcely read through in a whole lifetime? The

learner is not instructed, but burdened by the mass of them, and it is much better to surrender

yourself to a few authors than to wander through many" (Goldsborough, 2002). The title of this

paper is found in the Old Testament book of Ecclesiastes and was written by King Solomon

sometime around the Tenth Century B.C. Both ancient writers recognized the concept of

information overload and cautioned against trying to "know it all." Both also allude to getting

lost in searching or reading large collections of books (information).

Do libraries cause information overload with our large collections and access to databases

and information via the Web? No. Libraries do not cause information overload any more than

grocery stores cause overeating. I do think, however, that libraries and librarians have a role to

play in combating information overload. There are three ways I believe libraries and librarians

can help fight information overload.

1. Librarians must portray themselves as "information advisors," not just "information

   providers." Librarians (especially in academic libraries) must be proactive in

   approaching patrons with offers to help find information and offering to provide

   training in seeking and identifying relevant and valid information. "Our future

   success as a profession will be driven by our ability to educate and connect with

   patrons as their information advisers, not as gatekeepers to massive collections of

   aggregated full-text titles" (Bell, 2003).

2. Libraries must keep up with new technology. As the new software that Gates (2005)

   talked about becomes available, libraries need to be recognized as experts in

   understanding it and using it. Most people do not have the time necessary to keep up

   with and understand new information management and search technology. Librarians

   need to be the professionals to which they turn for help.

3. Libraries need to provide training and education on information overload. Last week, I mentioned to one of our college's vice presidents that I had to present my final paper on December 8th. She asked me the topic and I told her, "Information overload." When she asked what that was, I told her and began to explain some of the causes and effects. Before I could finish, she got this "deer in the headlights" look and said, "That's what's wrong with me! What can I do about it?" Who better to promote awareness of information overload than the information experts – librarians?

What does the future of information look like? Will we become the civilization that Draper wrote about? Only time will tell. There was a time in history when information was scarce and available to only a few. Today information is almost unlimited and readily available to almost anyone. As information continues to grow, librarians need to take the lead in ensuring that it is managed and used wisely.

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