Preface

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As I am writing this preface, I am keenly aware of the many emails I still have to answer, the phone calls that I have to return, and the piles of papers on my desk that still need to be processed. I cannot resist to occasionally check my email, but try not reply to or be distracted by any message. I set my telephone directly to voicemail, so I can catch incoming messages later. A few times, however, I do interrupt the writing process: there are some emails that I really should respond to today, and let's check my voicemail anyway to see if there are important messages. Soon, I find myself making calls after all, and I grow frustrated with the interruption that I initiated myself. I try multitasking, listening to voicemail messages while simultaneously reading text on my screen. I switch back and forth between the screen of my PC and that of my smartphone. No, this is not working well! Let's concentrate on the writing process!

To prepare for the writing of this preface, I consulted various information sources, including Web of Science, Google and Google Scholar. Finding information on the topic of information overload has turned out to be easy, but there is too much! Google gives me 3.9 million hits for "information overload" and Google Scholar gives me 61,000 articles. Where to start? Given my other obligations, I only have only about ten hours to read up on the latest literature, so after three hours of searching and collecting information, I am left with only seven hours to read the various articles I collected. So I need to read fast and smart, otherwise I will not have the required information for my essay. As I am already past my deadline, I realize that my essay will add another fifty or sixty kilobytes of information to the more than two billion gigabytes of information that will be produced and disseminated this year.[1] [ref. idc-extracting-value-from-chaos-ar] If only I get to finish it today.

I am, it seems, one of those individuals suffering from information overload, this disease of modern times that affects so many of us. Information overload has in recent decades become a phenomenon that is complained about in offices and homes, commented on in mass media, and studied by scholars. Books and articles warn us of the dangers of data smog and information glut and exhort us to get rid of information clutter and get control of our lives. Psychologists study how information overload leads to information anxiety, work stress and information fatigue syndrome, and warn for their perilous consequences. In management and organization studies, it is studied how information overload negatively affects productivity and worker well-being and how information overload may be managed more effectively. And in fields like information

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[1] J. Gantz and D Reinsel. *Extracting Value from Chaos.* IDC Corporation Report, 2011. Retrievable at http://idcdocserv.com/1142.

technology, library and information studies and management information systems, it is studied how information systems may be developed and set up so as to help reduce information overload.

The present volume makes an interdisciplinary contribution to the study of information overload that should be of value to professionals in a variety of fields. It considers causes of information overload, its harmful consequences, and possible steps towards a reduction of information overload. To help frame these issues and introduce the themes of the book, the remainder of this preface will contain some reflections on the nature of information overload and possible remedies for it.

The concept of information overload was popularized in the 1970s by Alvin Toffler in his 1970 book *Future Shock* and in later publications.[2] It has since then been picked up as a topic of study in various academic fields, including library and information science, management, organization studies, psychology, and others. With the proliferation of new information technologies, it has been receiving increasing attention as a research topic. Although there are many conceptions and definitions of information overload, most conceptions revolve around two central ideas: they define information overload as corresponding to situations in which the amount of information supplied to an individual exceeds his or her information processing capabilities, and they emphasize the negative consequences of these situations on the functioning or well-being of these individuals. Information overload, on most conceptions, is a state of having too much information to digest, with resulting negative effects on performance or well-being. In many conceptions, moreover, it is construed as a problem specific to the workplace. In other conceptions, it is defined more broadly, as a general condition of modern life that can manifest itself in different contexts and activities.

The academic study of information overload precedes the rise of the Internet and the emergence of email and mobile and social media in the 1990s and 2000s. Classical notions of information overload, developed before their rise, tend to define a particular type of information overload which I call *task-related information overload*. Task-related information overload concerns situations in which there is too much potentially relevant information to perform certain tasks or make certain decisions, relative to the information processing abilities and the amount of time and resources that an individual has available. As a result, individuals become overburdened and either perform tasks poorly or spend too much time and to many resources on the task, thereby causing problems in other areas.

Task-related information overload is simply the situation in which performing a task well turns out to requires wading through massive amounts of information to find and interpret those pieces of information that are most relevant to the task at hand, and finding that one does not have enough time and resources to perform the task well, given the information requirements of the task. A typical example would be a situation in which an employer is asked to write an internal report of the safety procedures in a factory, and is confronted with dozens of internal documents that may contain information about the factory's safety procedures, with very little time to process them. Another example is a case in which an individual wants to learn about atherosclerosis, only to find that her PC gives her 12,000,000+ entries on this topic to choose from, and to realize that she finds it difficult to determine which entries contain reliable information that is relevant to her interests.

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[2] A. Toffler. *Future Shock*. New York: Random House, 1970.

In the 1990s and 2000s, the emergence of new communication media like email, mobile communications and social media introduced a new kind of information overload. These media are confronting individuals with a continuous bombardment of messages that require their attention and interrupt their activities. The resulting type of information overload may be called *message overload* (or, alternatively, *communication overload*). In message overload, the problem is not so much the abundance of information available for a given task, but rather the abundance of received messages, each of which invites new task to be performed. Different from a mere piece of information, a message has a sender and one or more receivers. While some messages merely contain some information that the sender wants its receivers to read or see, others invite replies or define tasks that its receivers are expected or invited to perform. Messages can cause overload in two ways. First, if people receive too many of them, they fall behind in their response to them, and feel overloaded in the processing of messages and any further tasks that their proper processing requires. Second, messages often interrupt activity and divert attention, and may invite multitasking activities, thereby contributing to a feeling of overload.

Information overload is sometimes associated with a third type of overload, which I call *media overload*. In media overload, overload does not result from having too much information to perform a task, or being bombarded by messages that ask for attention and a response. Rather, it is the problem of having too much choice in media content, and of being lured by media messages that invite ever more consumption of media content. Media overload is the result of the abundance of content and channels in contemporary media, including television, radio, the Internet and mobile and social media, and including music, games, movies, lifestyle and infotainment sites, news sites, blogs, and twitter feeds. As a result of this abundance of content, media consumers may become distracted from everyday activities and may become superficial channel surfers without a focus in their media consumption activities, lost in a sea of media content.

Information overload thus comes in at least three forms, which include task-related, message and media overload. In the workplace, the first two are the most important, whereas in the home, the third is often the most important. Information overload in the workplace often correlates with *work overload*, which refers to situations in which the workload is greater than the amount that workers can take on given the time and resources that they have available. Work overload can exist independently of information overload, for example in professions such as construction work or farming in which the processing of information is not a major part of the job. But in today's offices, work overload is strongly correlated with information overload. Today's office workers are bombarded with messages that define or prompt tasks, and these tasks often requires the collection and processing of large amounts of information under time pressure. Both the amount of messages to be processed and the information-intensity of tasks to be performed are major contributors to work overload in office environments.

That information overload has negative consequences for the functioning and well-being of individuals is often considered to be an integral part of its definition. Information overload negatively affects performance because it engenders poor decision making, poor execution of tasks, loss of time because of interruptions in work activity, and diminished creativit. It also negatively affects well-being by contributing to stress, anxiety, fatigue, loss of motivation and even depression. From an organizational point of view, information overload in workers may result in loss of productivity, poor strategy and implementation processes, and resulting economic

losses.[3]

Why has information load become such a pressing issue in our times? Some of its more immediate causes are found in changing practices of producing, transmitting, storing and consuming information, which are themselves driven by recent developments in information and communication technology (ICT). Developments in ICT have enabled a variety of developments that contribute to information overload: increased production of new information, easy and cheap duplication, storage and transmission of information, an increase in new information channels such as e-mail and instant messaging, and a democratization of the roles of information producer and provider, which allows anyone to easily generate content and disseminate it to others, which has resulted in an abundance of new content and has contributed to a low signal-to-noise ratio.

It is not just developments in ICT, however, that have yielded information overload. It is also transformations of workplaces and organizations, as well as larger changes in culture and society. Work has changed because of globalization and economic restructuring. In his well-known study of the information society, Manuel Castells argues that since the 1970s, a new, global capitalist economic system has been forged, which is highly competitive, flexible in its labor and production processes, and organized around ever changing networks of individuals and organizations rather than factories. These networks are held together by ICT. In this new economic structure, there is an imperative of constant communication and the constant production and absorption of information. Information and communication processes are moreover subject to competitive standards of efficiency and quality standards.[4]

Everyday life is changing as well in the information society that has emerged since the 1970s. Contemporary society is a highly liberalized consumer society, centered around individual choice and opportunity. People draw up their own plans, make their own lifestyle choices, create their own social networks, and choose the products and services they want. They do not necessarily trust authorities and experts, but want to form their opinions on a multiciplicity of information sources. This highly individualized way of life requires constant management of information and communication processes. It results in what Heylighen has called *opportunity overload*, the paralysis that results from having too many options to choose from in life: too many ways to spend one's vacation, too many brands of detergents to choose from, too many ways of going from *A* to *B*.[5] The desire to manage opportunity overload is itself a cause of information overload, as it causes people to seek forever more information to guide their decision-making processes.

These factors suggest that information overload will not go away easily. Information overload rather seem to be aspects of the modern condition, bound up with the way we have organized the economy and modern life. So what are our prospects for limiting information overload? Part of the solution may be found in better information technology. Information systems may be designed to do some of the work of processing and structuring information for

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[3] M. Eppler and J. Mengis. The Concept of Information Overload - A Review of Literature from Organization Science, Accounting, Marketing, MIS, and Related Disciplines. *The Information Society*, 20(5), 2004, pp. 1–20.

[4] M. Castells. *The Rise of the Network Society. Information Age vol. 1*. Blackwell, 1996.

[5] F. Heylighen. *Complexity and information overload in society: Why increasing efficiency leads to decreasing control*. ECCO working paper, 2002. Available at http://pespmc1.vub.ac.be/Papers/Info-Overload.pdf.

us, and to help us interpret and recognize relevant information. Better search engines and filtering systems may be developed, intelligent agents may help us with information queries, the development of semantic web technologies can further facilitate information retrieval and organization. As philosopher Hubert Dreyfus has argued, however, intelligent processing of information requires that information systems are capable of discerning relevant from irrelevant information. This is a skill that computers are not particularly good at.[6] There are limits, therefore, to the extent to which information systems can help manage information overload for us.

Part of the solution must therefore lie in better information management by humans and organizations. Workers may be trained to master better techniques for sifting through information, and may learn to be more selective and efficient communicators in the messages they send out. Organizations may be redesigned so as to support a more efficient transmission and utilization of information resources. Fields like management and organization studies, library and information science, communication studies and psychology may help us in developing these improved tools for information management.

Computer Scientist David Levy has argued, however, that good information management is not enough to avoid information overload. As he argues, workers also need a space and time for thinking, reflection and extensive reading. They need to be able to step back from the constant stream of information piled onto them, and devote time to creative thinking, musing, and careful consideration.[7] Organizations may want to consider creating such room for their workers, running against the trend of an ever greater production and consumption of information. Productivity and quality may eventually improve because of it.

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[6] H. L. Dreyfus. *On the Internet.* Routledge, 2001, p. 8-26.

[7] D. Levy. Information Overload. In *The Handbook of Information and Computer Ethics,* K. Himma and H. Tavani, eds. John Wiley and Sons, 2008.