Information Overload: How to solve the problem?
Current trends in technology and its impacts to individuals and organizational context

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Abstract—**The Internet has had reflective effect on changing the life of each individual, not least by making consumers more involved in creating the content and offering products themselves using Internet. This paper reviews the problem of information overload, with particular reference to both individuals and business organizations. The paper tells that although the problem of information overload has existed for many years, in recent years the problem has become more widely recognized and practiced. The term 'information overload' has been recognized due to the rapid advances made by information and communication technology in the recent years, however, this does not make it clear whether this is making peoples life easier or more stressful. The paper reviews that even though there are hundreds and thousands of information available, it is still very difficult or even more stressful to find out the right information at the right time. Some solutions that are presented in order to solve the problem and reduce the information overload are: filtering the information, investing in knowledge and not information and the provision of value-added information (filtered by software or information curators). An emphasis is placed on technology as a tool and not the driver, while increased information literacy may provide the key to reducing information overload.**

Keywords—**Information overload, filters, Internet, information technology.**

I. INTRODUCTION

The famous term `Information overload` was firstly introduced by Alvin Toffler in his bestselling book in 1970, `Future Shock`. This term refers to the difficulties that an individual might face on understanding a particular issue or in decision making because of too many information available. This generally stands due to advanced technology and an increase in production of information [1]. Nowadays, this problem is increasing in both private life and workplace as well. In today world where there are hundreds of sources available to get different information, it is very difficult to classify and find qualitative data. That is why in one sense,

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we tend to believe that the life is getting easier, as you can easily find so many information available for any area under discussion you might need, but on the other hand, there are so many information accessible, that it is difficult to differentiate which is the right information to be presented. The general causes of information overload include: a rapid level of information being produced, a high number of channels available for just in time incoming information (e-mail, text message, and instant message), and huge amount of old information to excavate through, contradictions in existing information and so on.

Fig. 1 Information overload

The Guardian published went out with a article to illustrate the immense affect that overflow is having on human behavior by claiming that ` Too many emails, texts and tweets can lead to rising anxiety, lower intelligence – and a generation of BlackBerry orphans` [2].

Taking into consideration the great impact that information overload is having on people´s life, October 20th has been declared as Information Overload Awareness Day, which was first started by Jonathan Spira, an information overload expert that calls attention to the problem and how it impacts both individuals and organizations [2].

A book named Overload, which was published by Jonathan Spira shows some statistics of information overload that seem pretty intimidating. According to the book:

"-A minimum of 28 billion hours is lost each year to Information Overload in the United States.

-Reading and processing just 100 e-mail messages can occupy over half of a worker's day.

-It takes five minutes to get back on track after a 30 second interruption.

-For every 100 people who are unnecessarily copied on an e-mail, eight hours are lost.

-58 percent of government workers spend half the workday filing, deleting, or sorting information, at an annual cost of almost $31 billion dollars.

-66 percent of knowledge workers feel they don't have enough time to get all of their work done.

-94 percent of those surveyed have felt overwhelmed by information at some point to the point of incapacitation." [3]

An article that was published by The Economist explains that `"Information overload" is one of the biggest irritations in modern life [4]. A study which was done by Reuters in 1996 regarding the Information Overload, which was called `The dying for information` found out that people at that time were spending a lot of time for finding information. Based on the survey, 38% of overall managers that participated in the survey were spending immense amount of times to get the appropriate information and be able to make decisions. 43% of the respondents that participated in the survey believed that the decision making process was delayed due to the lack of information available. The main and most important suggestion given by the survey was that companies should start to think about information management very seriously as soon as possible [5].

According to Basex, A New York based company, which is very active in the war against information overload 'If they all sent 10 percent fewer e-mails it would have a $180 billion annual impact worldwide in the workplace'. This does not obviously include other SMS messages, Facebook-Twitter-Google+ social networking that interfere to people on a daily basis [6]. Marsha Egan, who is a professional efficiency coach, thinks that what is currently happening has its own advantages and disadvantages as well. On a matter of seconds we are able to send instant messages all around the globe and people can be connected and reached 24/7 which automatically removes the stress of too much information available in one way [7].

E-mail remains to be one of the major sources of information overload, as people are having more and more difficulties to keep up with the volume of incoming messages. Besides that, dealing with commercial spam messages is another headache for people as they are struggling to keep up with the flow [8]. Big companies such as: Yahoo, Google and Microsoft are working hard to come up with new programs that would make it possible for users to read out easier the emails in order to keep up with the flow. On a yearly basis, the research firm Basex calculates the cost of information overload and they are increasing drastically each year. According to the statistics provided by Basex, only in 2008 it is estimated that the information overload has cost to the US economy $900 billion in lost productivity. For 2006, the loss was estimated to be $588 billion [9].

Etzioni (1989) in a research published in Harvard Business School suggests `that the surging volume of available information—and its interruption of people's work—can adversely affect not only personal well-being but also decision making, innovation, and productivity`. In one study, for example, people took an average of nearly 25 minutes to return to a work task after an e-mail interruption. That's bad news for both individuals and their organizations. He continued by stating that that before the revolution of internet and technology, high level executives all around the world did not dear to even dream that one day they would be able to read and learn about the business environment like an open book. Currently, there is that much information available, that there is a real possibility and dangers for managers to fail in their decision making due to information overload [10]. According to Bill Gates, Microsoft Chairman, the issue of information overload is over blown by general public and the media as well. He believes that there are some particular industries and areas where there lack of information. Gates believes that the main problem of the people is not being able to find full information at the same place as the data are spread all over and at this point they start to feel stressful and confused. Microsoft nowadays is working on a searching platform to find the right answers just-in time in order to be more effective and efficient for internet explorers [11].

II. How to Solve the Problem: Invest in Knowledge, Not Information

Many people believe and think that knowledge and information are two equal terms. Information refers to general data which can be expressed by different numbers, words, and images and so on. On the other hand, knowledge refers to the realistic use of available information. According to Business Dictionary, knowledge is 'Human faculty resulting from interpreted information; understanding that germinates from combination of data, information, experience, and individual interpretation' [12].

Knowledge is like a collection of very helpful tools. Those tools allow you to function at high levels in your family, community, at work and in society. We do need knowledge to get through the day, even for the most basic things such as: how to love our families and friends, how to make some kind of a living and as we grow and learn, perhaps accumulate some good judgment.

Information by itself should never be mistaken for knowledge. Knowledge has been defined as the productive use of information.

Information	Knowledge
know what	know how
what is	what works
interesting	useful for action

Fig. 2. Knowledge vs. Information [18]

Knowledge management is considered to be the main

asset of the company. It is seen as the basic and most important source of competitive advantage within organization. Knowledge should be considered as the core business of an organization. In 1988 Peter Drucker wrote: 'The typical business [of the future] will be knowledge-based, an organization composed largely of specialists who direct and discipline their own performance through feedback from colleagues, customers and headquarters. For this reason it will be what I call an information-based organization' [13]. Instead of wasting money in obtaining and gathering information, the focus of the organization should be toward the management of information which can serve to many future generations and guarantee a successful development.

III. Filtering Information

Another solution would be to filter information available on the internet. As the technology and virtual world is evolving there is a need for real time curators who are going to filer the information available by dividing them into groups and subgroups so people will have less difficulties and anxiety to find what they are looking for. According to Technologist Clay Shirky: 'It is not information overload but filter failure'. Shirky believes that internet has made it easier for publishers to upload any data in a cheaper way, and it should be their goal to solve the issue [14].

Today, there are so many means of instant messages and communication. Internet together with mobile phones, e-mails, instant messages; and teleconferences, have all together contributed to the fast flow of information globally. With more than 100 million distinct websites, one trillion unique URLs and an ever-increasing amount of e-mail, people are drowning in information [15].
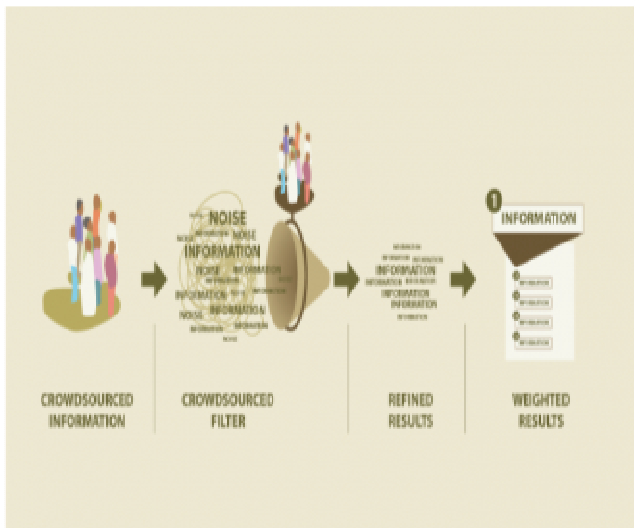

Fig. 3. Filtering Information [19]

Another answer might sound a bit too technical, however, other hope that remains is that those professionals who have created `the mess of this much information` available, they will be the ones who are going to invent some creative filters and make just in time filtering. Xerox, which is one the largest multinational corporate all around the world are planning to restore "information sanity" by developing better filtering techniques and devices that will help people to manage better their virtual exploration. On the other hand, we have Google who is trying to improve the online searches and lead the so called exploration in this virtual world [16].

IV. Final remarks

In conclusion, from the point when internet started to be used for simple tasking as informative and communications channel, its growing to extreme levels of substituting human effort and knowledge with products like cloud computing. Moreover, tendency of e-world is rapidly growing into artificial intelligence which until lately was only interpreted through movie AI. Recent study by Harvard and University of Wisconsin reported by Wired showed that users of Google are becoming more stupid [17].

This should not come as a surprise as businesses, Governments, and other organizations are transferring their operations into virtual word through floating e-brains like salesforce.com, Microsoft SharePoint etc. More specifically, because of internet one can agree that the life and communication is going toward extreme simplicity while removing drastically the need to for physical input by humans. . The high-tech advancement in technology and globalization has dramatically increased the need to understand the changing market. Employees had to deal with such a big change without any training and time and therefore they sometimes feel like they are drowning in such a big flow of information [18].

How far can this new relationship between internet and human develop can be answered only by how far can go services like cloud computing to the point when we will not be talking about dependency, but rather control of humans by internet based artificial intelligence.

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