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Effect of Information Overload on Decision's Quality, Efficiency and Time

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Abstract: Information overload is considered as phenomena to which we are exposed to too much information that is of no use. Such exposure to too much information significantly undermines the process of undertaking effective decision making in an organization. Moreover, it subsequently undermines the quality of decision making in an organization. This research paper critically evaluates the concept of information overload in an organization. Moreover, the analysis will involve the various causes of information overload, the symptoms of information overload, the impacts of information overload and the various strategies that can be deployed in addressing the issues associated with information overload. Additionally, from the analysis recommendations to reduce information overload include having a high level of management control over decision making and employing technology based decision making such as through the use of data mining.

Keywords: Information Overload, Decision efficiency, Decision quality, Decision time

I. INTRODUCTION AND BACKGROUND

The term' information overload 'may be defined as problems that emanate, arise and vitiate cognitive processes of identifying problems and enforcing remedial measures to address and resolve them. In other words, the relentless, surging and overpowering cascades of Information Technology (IT) that is geared to improve productivity sharpen performance and boost profitability (bottom lines) may now work in reverse gear and does little except, demote productivity, dull performance and shrink enterprise profitability and bottom lines, sometimes in most unrecognizable manners [1].

Information overload is not a new concept since the twelfth century and especially since the advent of the Gutenberg printing press, individuals have been complaining about the wide range of information they had to consume in order to contribute to society. The internet allows us to share that information with each other (e-mails, videos, photos, e-documents like books etc.), with virtually no limitations. Mobile technology such as laptops, tablets and phones have become part of us so that we are able to connect with each other anywhere, anytime. Companies have adopted this as part of their daily operation causing information to flow from every direction [2].

In "Information Overload: Causes, Symptoms, and Solutions," an article for the Harvard Graduate School of Education's Learning Innovations Laboratory (LILA), Joseph Ruff [3], says "we are bombarded with so much data that we're on information overload". According to this, we can say information overload is when our ability to process information has passed its limit, and further attempts to process information or settle on accurate decisions from the surplus of information leads to information overload.

Ruff [3], points out that information overload interferes with our ability to learn and engage in creative problem-solving. In an example, venture capitalists with too much information cannot make accurate adjustments to their assessment process, and as a result, of this, their learning is impeded. "Once capacity is surpassed, additional information becomes noise and a reduction in information processing and decision quality… having too much information is the same as not having enough" [3]. Ruff [3], continues to state that, "As might be expected, with little or no information, people have few or nothing to process and consequently make poor decisions. However, after a certain point is achieved, the decision-maker has obtained more information than he can process, information overload has occurred and decision-making ability decreases. Any information received beyond that point will not be processed, may lead to confusion and could have a negative impact on the individual's ability to set priorities as well as remember previous information [1].Fig. 1 illustrates the information load inverted U- Curve.

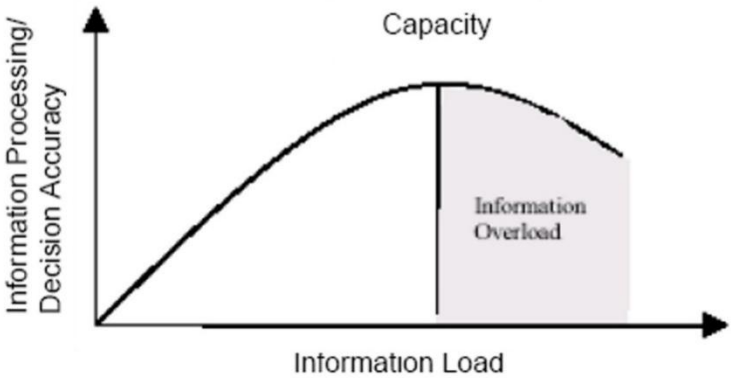

Fig. 1 Information load inverted U- Curve. Source: [1]

II. CAUSES OF INFORMATION OVERLOAD

Several studies have been led to the point of assessing what the causes of information overload are, all the results have shown that that information overload is usually as a result of a combination of overlapping factors. For example, some causes of information overload include the following causes; irrelevance of information, multiple information sources, lack of enough time to effectively understand information, and too much information [4]. Fig. 2 illustrates the factors cause information overload.

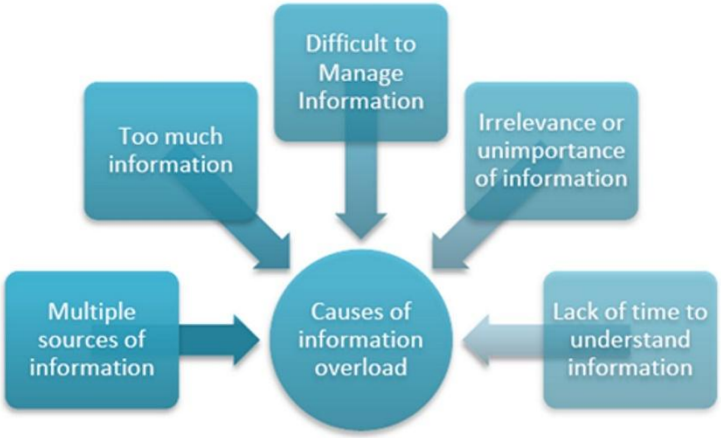

Fig. 2 Factors cause information overload

The main cause of information overload is the various sources of information. Information overload may also be caused as a result of an increase in the amount of information available. Also, the maximizing volume of data can lead to difficulty in handling this data. The increase in the variety of information from different sources can acquire information to be insignificant and irrelevant. Overload can also develop from a lack of time to digest and comprehend the available information [5].

In a business setup, people with access to computers internet and email and other sources can attribute some other causes of information overload such as ease of creation in computers, duplication, and transmission of data across the Internet which increases the available channels of incoming information. All this together with the lack of a method for comparing and processing different kinds of information contribute to the problem of information overload [4].

Another publication, An Investigation and Analysis of Information Overload in Manager's Work by Tao and Li [6], identifies that Information overload seems definitely connected with the amount, nature of skills and knowledge which are possessed by processing quality and speed and therefore they impact information overload. Apart from the work factors, some studies show that the individual and his or her qualification, attitude, and experience are another significant factor. While earlier studies simply state that a person's capability to process data is limited, more recent studies include particular limiting factors such as personal

skills. The level of knowledge and skill coming from experience and personal traits thus directly affects the capacity to receive information.

Other studies have categorized the causes of information overloading differently. Joseph Ruff [3], in his article "Information Overload: Causes, Symptoms, and Solutions," an article for the Harvard Graduate School of Education's Learning Innovations Laboratory (LILA), he organizes the causes using the five categories People, Technology, the organization, processes and tasks and information attributes.

III. SYMPTOMS OF INFORMATION OVERLOAD

There are various symptoms that employees may depict that relates to information overload in an organization. Some of the symptoms of information overload among employees in an organization include the following [1];

- Poor concentration due to the overloading of short-term memory
- Hurry sickness, which is the conviction that one should continually race to keep pace with time
- Pervasive hostility resulting in a chronic state of irritability near anger or even rage
- Habituation or over stimulation which causes the brain to shut down and enter a trance-like state
- "Plugged in" compulsion is the strong need to check email, voice mail and the Internet in order to stay "in touch"

Traditional stress including lowered immune response, endocrine imbalance, depression and the experience of "burn out".

IV. IMPACTS AND EFFECTS OF INFORMATION OVERLOAD

M.I. Mungly and A.M. Singh [7], on their publication "understanding the effect of information overload on teleworkers" stated that research into the problem of information overload has identified several effects on individuals and organizations [7].

1. Effects of information overload

- Impaired quality of work.
- Mental and psychological related issues.
- Increasing stress on individuals due to the limit in information processing capacity.
- Negatively affects staff productivity, quality of decision making and levels of stress.

Extra time spent searching, sorting and processing information.

The longer people are subjected to information overload, the more negative its effects on physical and mental well-being. A study was conducted with 1,313 senior, middle and junior business managers from the United States, England, Hong Kong, Singapore and Australia. Seventy-three percent indicated that they needed enormous amounts of information to be successful in their job. Yet, they also believed that information overload was responsible for other problems example 33% felt they were suffering from ill health,66% reported tension with fellow workers and diminished job satisfaction and 62% admitted that social and personal relationships were suffering. The health of the employee is also affected due to negative stress level from the information overload, the level of work enjoyment also reduces and which in turn can affect the aspect of satisfaction in life, some of this can be argued from basic knowledge in psychology [3].

2. Impact on performance

Ruff [3], in his publication observes that decision-makers increase their information processing as the result of an increase in information load. Once capacity is surpassed, however, additional information becomes noise and results in a decrease in information processing and decision quality [8]. In a study of bank loan officers predicting bankruptcy, it was found that operating under information overload, officers required more time to make predictions that were less accurate than when information overload was not experienced [3]. It is interesting to note that when making complex decisions, we may feel the need to have, and therefore request, massive amounts of data [9]. In this conclusion it comes back to having too much information is the same as not having enough.

3. Poor decision-making

Information overload tends to reduce the mental capacity of knowledge workers. A phenomenon also known as Attention Deficit Trait (ADT), is an informal term coined by the psychiatrist Dr. Edward [10]. He asserts that the cognitive impact of info mania causes people to work well below their full potential; they produce less output, think superficially, and create less new ideas – despite working an increasing number of

hours. Evidence from other studies shows an increase in error rate, including errors in management decision–making.

Poor decision-making due to information overload can largely be attributed to the fact that when people have been exposed to excessive information tends to [3]:

- Become highly selective and ignore a large amount of information or give up and don't go beyond the first results in many cases.
- Need more time to reach a decision based on the information.
- Make mistakes in the process.
- Have difficulties in identifying the relationship between the details and the overall context.

V. HOW TO ADDRESS ISSUES ARISING OUT OF INFORMATION OVERLOAD

Several suggestions have been given on the best way to deal with information overload so as to take care of the issues arising from the overload. On a summary, most solutions to information overload can be categorized into Technology related solutions and management strategies. Technology solutions range from the use of visualization tools for data presentation, relying on push technologies more than pull technologies among other technology strategies. Management strategies include but not limited to addressing strategic plans for the organization, looking at cultural issues and implementing personal information strategies [11, 12].

In any business, a combination of both this strategy can work to reduce information overload one such strategy is the use of visual representation. Advancement in technology has provided a large collection of data analysis tools. These tools also simplify information presentation by giving us visual aids for easy interpretation of the data which helps increase efficiency in decision making. Data visualization also known as information visualization or scientific visualization is the process presenting information in visual form. Data visualization can also be defined as the presentation of data in a pictorial or graphical format, this creates patterns, trends, and correlations that might go undetected in text-based data. Several data and information analysis programs will contain tools to create these visual designs [13].

According to the article publication "Visual Representation: Implications for Decision Making" by Lurie [14], visual aid and the different tools available can improve efficiency of marketing managers offer new insights and even increase customer satisfaction, this benefit as observed lead to form of bias in the long run calling for a further analysis of the output from visual aids. From this further study can be conducted to review this improved efficiency and increase processing of as much information as possible [14].

Technology can help in reduction of information overload other than the aspect of creating visual aids several strategies can be implemented both at personal or company level and they include; technology training for all people involved in such fields as database management, search engines, data storage and retrieval. Use filters effectively like to eliminate spam in mail. Involve people in the design of IT systems to gather what is relevant for the fields they are involved in [15, 16]. Spend more time and money improving user ability to operate technology fully and successfully as opposed to buying more and better technology this can include the training part and involving technology coaches for the software in the organization [14].

When communicating in organizations using technology training effective methods of communication are emphasized examples use of executive summaries, use of headers to introduce and divide content, writing of clear, short and succinct memos and email when necessary and address the same to specific people concerned and organizing content into logical chunks for easy interpretation.

The computer world is now fully integrated into decision-making. Working with lots of data computerized models is now part of the daily software used as an aid to managers [17]. Several decision models help in dealing with big data one of these models is the mathematical model also known as a quantitative model. The models help in dealing with information overload in that they help in compression of data using techniques to extract only what is needed for decision-making support. Some of the best decision model tools decision-making transparent and easy with a collection of influence diagrams and powerful built-in probabilistic analysis. Influence diagrams make it easy not only to understand the model but also to key out key decision-making variables and their relationships. Built-in tools for managing risk and uncertainty include are also included [18].

The software tools like ones used in decision making make it easy to work with companies by bringing data easily closer to the people. This brings the following advantages to businesses large or small:

- With data instantly available, the decision-making process gets to be leaner and more proficient. Decisions can be made quickly to respond to needs within the organization.
- Communication between departments turns out to be more effective as dashboards and analytics can easily be shared and distributed across the company.
- Managers can retain greater control of the decision-making process by having the most comprehensive, important and up-to-date information at their fingertips as decisions are made.

- Cost reduction. Some researches and especially case studies have documented DSS cost saving from labour savings in making decisions and from lower infrastructure or technology costs.

Recent software tools are designed to use data mining effectively. Data mining is a process by which raw data is analyzed to select pertinent and valuable bits of information, depending on what one is looking for. The computer programs used for data mining utilize different sorts of criteria to 'decide' which information is important and then sort through to show trends. This can be useful for every aspect of the society where data is required for decision making. When looking at management strategies for dealing with information overload several studies have been conducted and most revolve around installing the right discipline to be more organized and avoid information overload. Some of this strategies include; developing a personal workable information strategy example acting on information as it is received; trashing unnecessary information not allowing oneself to stop activities of low priority, developing organizing systems, for example, weekly planning which mean not to try to remember everything you have to do; and improving your information age skills, standardizing of operating procedures in organizations, allowing more time for task performance, simplify functionalities and design of products, use simpler information processing strategies, building a creating in our schedules a "technology free time"[19, 20, 21].

VI. CONCLUSION

In conclusion, the analysis that was undertaken was aimed at evaluating the concept of information overload, causes of information overload, symptoms and effects of information overload in an organization. From the analysis that was undertaken, some of the causes of information overload include the following; irrelevance of information, multiple information sources, lack of enough time to effectively understand information, and too much information. on the other hand, symptoms of information overload include but not limited to the following; Poor concentration due to the overloading of short-term memory, poly-phasic behaviour or multi-tasking often resulting in diminished rather than increased productivity, Hurry sickness, which is the conviction that one should continually rush to keep pace with time, and pervasive hostility bringing about an incessant a chronic state of irritability near anger or even rage. On the other hand, from the analysis that was undertaking, some of the effects of information overload included the following; Impaired quality of work, Mental, and psychologically related issue, Increasing stress on individuals due to limit in information processing capacity, Reduces attention span, upsets family life, affects our reasoning, takes over our personal time, Negatively affects staff productivity, quality of decision making and levels of stress, Extra time spent searching, sorting and processing information.

RECOMMENDATION

In order to effectively address the negative effects associated with information overload, organizations need to adopt and implement the following strategies:

- Embrace effective and multi-departmental communication between through the use of dashboards and analytics which enables employees to have a high level of information and distribution.
- Managers can retain greater control of the decision-making process by having the most comprehensive, relevant and up-to-date data at their fingertips as decisions are made.
- Employing the use of technology based data analysis for decision making such as data mining. This will enhance higher level of data security, accuracy and ease of handling large amounts of data in an effective way to enhance faster decision making and accurate decision making.

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