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Information Overload

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Information Overload, a phenomenon defined by the brain's inability to filter information presented to it, has the potential to send the brain from a state of active engagement, to passive consumption, to active disengagement. Within a corporate social network, much of the potential for Information Overload can be avoided if the phenomenon is kept in mind during the design, creation and use of the network. In this White Paper by the Atos Scientific Community, the psychology behind Information Overload is discussed to help designers, creators and users avoid overload

Information Overload

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Introduction

We live in an age of instant information gratification. Not only do we have access to a multitude of communication and information channels, new innovations and the mass adoption of technology have caused the volume of information available to us to grow exponentially. The media revolution has made it possible to not only access, but contribute to these channels and mediums from home, at work, as well as on-the-go. We don't have to wait for information anymore; we can look it up wherever we are and whenever we want to. Even more so: much of our information is pushed to us by others through social media or other communication channels. This has led to a state of being where we are always connected, always engaged, with the digital communication networks that we subscribe to—and those of us in the modern corporate landscape subscribe to quite a few, either by choice or by necessity. How do we prevent the network overloading its users?

Besides social media channels like Twitter, Facebook, LinkedIn, RSS feeds, Google+, Foursquare, Pinterest, and so on, we also connect through a multitude of digital corporate social networks, or sometimes—mercifully—just through one. An average company in any given sector helps employees connect through an email client, an office communicator, a file management solution, and sometimes through on-line video or voice conferencing programs, private social media accounts and/or external social software. The smart employer combines all these mediums into one: a corporate social network solution that combines the best features of these networks, and actively battles duplication of messages and files.

Active to passive to disengaged

The average worker is often confronted with such an overwhelming amount of channels and messages that he ends up "missing the wood for the trees". The human brain is based on repetition: neural pathways that are stimulated repeatedly become more stable and literally thicker[1]. These well-stimulated neural pathways become the information highways of the brain — easily traveled lots of lanes, well-lit. Tasks we are familiar with, we perform with great speed, finesse, and ease. They require little brain capacity, so we can deal with a lot of these tasks without much effort. When we are confronted with new situations, the brain is forced to make new neural pathways, or to build upon barely established ones. These are the roads less traveled: pitch black, sandy, and full of holes. The use and formation of these pathways takes a lot of mental capacity, especially when the tasks for which they are being created are continually changing, and require great speed to keep up with. If the brain fails in keeping up with the load placed on its neural pathways, the brain shorts out. This phenomenon is called Information Overload, and it has the potential to impact any social network—including corporate ones.

When confronted with an amount of information that the brain can no longer manage, the brain goes from a state of active engagement to passive consumption, a consumption where information is taken in but no longer processed. At its worst, the information is actively turned away, and the user disengages. For our average worker, this means they go from actively reading and contributing to their social network(s), to skimming and not contributing, to actively avoiding the network they are required to engage with, simply because the amount of information that comes to them is no longer helpful to their work. The corporate social network that is supposed to help employees complete their tasks and enjoy their job becomes a task on its own, and sorting through the stream of information that comes through, requires so much time that they must neglect either the network or their tasks if they want to complete at least one.

Defining the phenomenon

Information Overload is neither a new phenomenon, nor a new term. It is a symptom of over consumption and the inability to refine (online) experiences based on interest and importance[2]. American writer and futurist Alvin Toffler popularized the term, most notably in his excellent Future Shock, written in 1970, but it existed long before that. In his book, Toffler suggests that Information Overload is a symptom of another phenomenon, referred to in the book's title: future shock. Future shock is defined as the personal perception of too much change in too short a period of time[3]. This means that there is a human element to the phenomenon, and that some people are more at risk of experiencing it than others. In this paper, we will look at the phenomenon of Information Overload itself, as well as risk factors that managers can identify with their employees. We all know the average employee does not exist in the corporate world, and as we will see, factors like age, nativity in the on-line environment, personality traits and even the nature of the employee's work can have a severe impact on a person's ability to cope with the flow of network information. As the implementer of a corporate social network solution, it's important to understand the phenomenon of Information Overload, so you— or those you have instructed to do so—can actively work to counter the risk of overload and disengagement of the network's users. This will be the main focus of this paper.

Spotting the pitfalls

A corporate social network—when implemented correctly—offers both the company, as well as the employee, clear and concise communication lines, a means of optimized communication, file sharing, and inter-office collaboration. When implemented incorrectly, a corporate social network becomes a hindrance, an enforced medium that usurps the previous system—a system that all employees suddenly look back on with fond memories. It is within this framework that Information Overload becomes a defining factor, for both employees as well as employers.

Assessing the risks

Extensive studies have shown that one of the primary conditions for wellbeing is that the challenges of a situation need to match a person's skills; whenever the challenges become higher than the skills, wellbeing is replaced by anxiety and loss of control[4]. Two thirds of managers suffer from increased tension and one third from ill health because of Information Overload[5]. In a reaction to this research, the term Information Fatigue Syndrome was coined to describe the negative symptoms related to Information Overload: anxiety, poor decision-making, difficulties in memorizing and remembering, reduced attention span, reduced work satisfaction and strained relationships with collaborators. Some managers even described feelings of helplessness, depression, and other symptoms now associated with burn-out[6][7].

The shifting nature of Information Overload requires a closer look at the pitfalls of networking and information distribution. The human element has a huge influence on susceptibility to overload, but the design of the system, and the manner in which the corporate social network is implemented, makes or breaks the adoption of the network, the quality of use, and the risk of Information Overload for the user. The greatest risk of Information Overload lies in three factors: the novelty of a medium, the speed with which the medium changes, and the medium's irregularity[8]. All three require rapid adaption of the brain.

Novelty

The novelty of a medium influences everyone; there is a learning curve in getting familiar with a new medium, as well as a period of adjustment from previous practices to the desired practice. This adjustment can be seen very well when transferring from an email environment to a non-email environment, where information distribution over the messenger is encouraged: a period of overlap is required to get those unfamiliar with the messenger "up to speed" on functionalities, and to inspire enough confidence in the user to abandon the old for the new.

A person's learning curve and the willingness to adopt new technology is linked to a multitude of characteristics within the person: the mental flexibility of the user, the willingness to adopt new technology, years of use of the old system, the level of familiarity within (corporate) social networks, personality, and even the messages from the company and leaders.

Speed

The speed of information exchange within the medium is, perhaps, the greatest pitfall of all, when it comes to the risk of Information Overload. Not only does the speed of change — updates to the system itself, and frequency of messages, but also the length of the period of adjustment — influence the learning curve, it also forces the user to multi-task in ways they are unfamiliar with.

Human beings have clear limits on the amount of information they can process, often called bounded rationality[9]. The phenomenon is clearest in the 'magical number' that is linked to our short-term memory: at most, we can keep seven (+/- two) items at once in our working memory, and even with those seven in mind, there are clear limits on the speed and accuracy with which the brain can process them. Any item beyond seven causes the added item — well as the previous — to be partially ignored, forgotten, distorted, or otherwise lost[10]. Which part, however, is completely unclear and can only be assessed by going through the reproduced information for holes in light of the original information statement.

A 2008 study by Mark, Gudith and Klocke titled 'The Cost of Interrupted Work: More Speed and Stress', has shown that there is a definite lapse in the quality of work, as well as a high level of perceived stress, frustration, time pressure, effort and wellbeing associated with continual interruption of work[11].

Irregularity

Irregularity is the brain's worst nightmare. Not only does irregularity require alternate pathways within the brain — in addition to the new pathways established in the learning curve — but it also causes a delay in information transmittance. Irregularity can relate to both the system itself — predictability of use, stability, perceived usefulness of the medium[12][13] — as well as input from users: relevancy of messages to the individual user, predictability of use by the user himself, as well as other users and the level of adoption within the company.

Predictability of use and the level of adoption are especially important to prevent Information Overload. Predictability, in this case, is shared between system and user, while the level of adoption is solely in the hands of the user themselves. The two are linked however, and the system should encourage a standardized work method within it, but that method must be adopted by the network's users if a predictable standard practice is desired.

An example: the corporate social network incorporates both a file management system as well as a messenger. Our regular worker wants to share a file located in the company's cloud with his colleague. The standard practice is to link to the desired file within the cloud over messenger, but the messenger allows file sharing, so our worker — who is either unaware of the procedure, or is simply copying behavior from the old email days—saves the file to his personal hard drive, attaches the file to a message, and sends it off to his colleague. Now his colleague has a file, outside of the cloud,

which is inaccessible to anyone but himself, unless he places it back into the cloud, causing duplication of the file. To the colleague, the system is completely unreliable, and receiving documents in a multitude of ways causes a lot of irregularity that can attribute to Information Overload.

When faced with even one of the factors described above, the amount of "noise" in the channel increases, and the risk of Information Overload goes up.

Noise

Before we get bogged down in negatives, there is nothing wrong with a little noise in communication channels. The term 'noise' is used to describe any external or internal influence on the human ability to process a message. Noise often includes company messages that all employees need to be aware of. Effective communication teams work hard to make the message relevant to

users, segmenting audiences where they can, but messages need to be timely, concise and relevant to the user to be read – otherwise they are seen as more noise.

This also includes the possibility of dropped, skipped or simply missed messages, but also messages which are not understood, which are lost in an influx of other messages, or repetition of the message in the same channel again and again.

What is perceived noise varies from person to person, and depends largely on a person's ability to filter relevant messages from the communication channels available. These filters are discussed in the next chapter. All communication channels have a certain amount of noise to be dealt with; in many cases, it seen as a characteristic of a lively, informative and creative platform. Noise becomes an issue when it is irrelevant and interferes with the employee's ability to perform their job — these are the instances where noise leads to overload.

The human filter

Human beings are perfectly capable of filtering noise, some of us are simply better equipped to do so than others. Filtering is a skill and it can be learned. Due to the volume of information in (corporate) social networks, acquiring and developing the ability to filter has become the key strategy to prevent Information Overload: if we learn to filter away all the noise, we won't run the risk of being overloaded. Similarly, even in organizations with effective Internal Communications functions, reducing the volume of emails is a constant challenge. A person's ability to filter relevant messages from an environment full of irrelevant messages and noise generators is greatly linked to the three risk factors described before — the novelty, speed, and irregularity of the medium — but the human filter is different for every person, due to personal factors, some of which are listed below.

Adaptability

A person's ability to adapt to a situation is influenced by a multitude of factors. Some people like change, others do not. Some people are open to change, others are not. In general, younger people adopt change more easily, and adapt to a changing situation far more willingly than those who are older. Senior employees have often seen a lot of change in their careers — as they often stay with companies longer than the younger generation — and have subsequently become skeptical that the latest change program will succeed.

If a person is unwilling or unable to adapt to change, the risk of overload increases, simply because both the messages and the medium are seen as a single source of irrelevance. There is nothing to filter, as nothing connected to the medium will be perceived as relevant. To an unwilling person, the medium will always be new, frustrating, constantly changing and it will always be perceived as irregular.

Familiarity with the medium

Familiarity with a medium is a key factor to the minimization of Information Overload. Familiarity with the medium removes the novelty of a medium and greatly reduces the irregularity of it. Familiarity describes the level of understanding and adoption of the medium, in this case the corporate social network, but also what is required of them as a user, and what they can expect the corporate social network to facilitate. People who are familiar with a medium know the written and unwritten rules of the network and know how to best apply them to their situation.

Look at a medium like Twitter — probably the best social noise generator of our time — which not only encourages frequent posts, but which encourages frequent posts about things which will often only interest the user. It's a constant stream of messages which are only of interest to anyone who follows you, but it is understood that you do not have to reply to, or even acknowledge every post. In fact, it's perfectly understood between Twitter users that you are not required to read back in time to catch up on missed messages. Twitter is about the here and now that interests you. Finding those few gems takes a lot of noise scanning.

Every network has its own written and unwritten rules — a culture, if you will — that those who participate in it should strive to understand. Doing so greatly limits the risk of overload, as the culture dictates which messages can be filtered without consequence to the user.

Frequency of use

The influence of frequency of use is directly linked to the familiarity with the medium. When we use a medium regularly, we become familiar with it. We learn to understand it, as well as the people who we are linked to through it. The level of irregularity within the (corporate) social network drops, and the medium is no longer a novelty. In short: the more we use a medium, the more the risk of overload drops.

Digital natives

A digital native is a person who was born during or after the general introduction of digital technologies. Through interaction with digital technology from an early age, digital natives have a greater understanding of its concepts, and are generally more adapt in maneuvering through it. The term is offset by 'digital immigrant', an individual who was born before the existence of digital technology and adopted later in life[14].

Natives generally suffer far less risk of Information Overload, as they have naturally developed filters for the noise of the online environment and tend to find their way around it easily by intuition alone. Immigrants suffer from Information Overload much more easily, due to the need to acquire skills cognitively before applying them. In general, immigrants move through the online environment consciously, instead of intuitively, and thus require more time to adapt to the environment and its changes.

While the theory of digital natives offers a foundation to filtering across generations, the theory does not offer a clear divide. An aptitude for technology can be found in any generation, just as a complete inaptitude. Besides that, the divide can be bridged with hard work and/or good schooling. Digital "nativity" — like all other factors here described — can have an influence on filtering, but it does not have to.

Active network management

The second you, or the company you work for, decide to implement a corporate social network, you acquire X new clients, where 'X' is the number of employees the company has, including yourself. This, in itself, has nothing to do with the network or Information Overload, but it is important to realize that those who create the Corporate Social Enterprise solution, are no longer in control of the design, the content, or the way the network is used the moment the network becomes open to users. A corporate social network requires a shift from 'push' to 'pull' when it comes to information distribution. It requires a leap of faith on the part of the employer; a willingness to step back and let whatever happens, happen, and above all, managers need to be a hundred percent behind the decision, to lead by example for the employees. A failure to promote these mental shifts will lead to noise in the channel(s), and that has everything to do with Information Overload.

Now we've looked at the human element—for both employer and employee—we can take a closer look at the network itself, as this is the area we—as employers or communication professionals—can help our employees in minimizing the risk of Information Overload. We will look at the five key points of involvement: the design, filter options, stability, content management, and empowerment.

The design

How a corporate social network is designed, dictates to the users how it should be used. This means that we — as designers, implementers and/or managers of the network — are in the unique position of helping our users in filtering their messages, and helping them limit their Information Overload.

A lot of users—especially the early adopters—will be digital natives, who are used to a large variety of social networks. "Reinventing the wheel" and running the risk of having to make changes to the network for it to comply to the known concept of a wheel, is a waste of time and effort, not to mention a great source of overload for those who are not as tech-savvy as the natives. If your network has a 'like' function similar to Facebook, call it a 'like' function. Fostering involvement through the familiar is a key strategy in minimizing overload.

One of the most desired features of any network is the ability to personalize its look and feel. Giving everyone the same homepage with top-down-inspired content will most certainly lead to overload: most often, this information is not only irrelevant to the user, but creates walls of foreign links and text that will drive the inexperienced user away, and will cause the tech-savvy user to dismantle the homepage—if they have the required rights to do that, if not, they'll most certainly turn off.

Take a long hard look at the involvement we ask of employees, especially in regards to integration within a digital corporate network: do we confront every employee with the whole of the network, or do we minimize the scope of the network to the requirements of the job description? In other words, do we require everyone to be involved with everything, or is involvement with their direct network enough for corporate integration? Foster networks

within the network — groups of people who work in the same field, or on the same project—and give them their own space to converse. Allow those outside of that network access to the group, but only if they request it themselves. If a subject does not influence a person's job, people generally not want to be bombarded with messages about it, yet nothing tempers involvement faster than limiting access to content when required.

The concept that every message must be seen by everyone, and that everything that is said on a corporate social network is relevant to every user has become outdated in the social media era. Promote an environment where information can be missed, and program it in a way that important messages are always fed to the relevant users—by way of another channel, personal message functionality, or '@ mentions', not a wall of forced text on a user's homepage. Decide what is 'important' and to whom and which channel to communicate this message on, if it needs to be communicated at all. For example, messages about changes to the company's strategy can be communicated through the Corporate Social Network in a 'push' fashion, but will most likely still not reach all employees. Spreading the message through multiple channels--some even non-digital--is encouraged, but only if the information is vitally important; if not, it's noise.

Filter options

Filter options are part of the design, but require special attention. Filtering is the answer to almost all forms of Information Overload, and is tied in to every source of it, as well as every solution. Overload occurs when either the network or the user is unable to filter the available information down to a stream that the user can understand and work with.

Filtering in a corporate social network takes on many forms. Search functions, highlighting, file management, and content management are amongst the most important ones.

▶ Search functions can be any technology-driven sorting mechanism provided by the network, but employed by the user. The standard 'search bar' function is one of the classic ones, but new technology such as tagging, communities and suggested reading based on interest lists are also included.

- The laws of bounded rationality require designers to focus the attention of the network's intended users on those areas that are of importance, while never overwhelming them with these attention-drawers. Highlighting important areas — like a notification feature — with a primary color or a blinking button draws the user's attention to any pressing issue within the network, splashing the entire page with sounds, colors and bright lights, will ensure nothing on the page draws the attention of the user.

- File management reduces noise by preventing duplication of files and messages, provides a logical location where information can be found, and gives a stable base for the continued sharing of knowledge. It's the backbone of any corporate social network, and if it's not indexed within the search function, the use and usefulness of the network will be greatly reduced.

- Content management is, perhaps, the most vital of filtering options, and it is tied in with a desired shift from push to pull information distribution. In the classic information sharing model, we started with the sender, and worked our way down to the receiver. Now, it's the receiver who calls out for the information from the sender; and in a corporate social network, everyone is a sender. This viewpoint requires the network to accommodate the input of hundreds or even thousands of users in a way that is constructive to the network, that is uniform in a way that encourages noise reduction, and that is intuitively so — perhaps the hardest to achieve of all three.

Stability

Whatever you do, do not add users to a network that is not ready for active use. Presenting your employees with a mandatory network that is slow, crashes regularly, does not do what it's supposed to do, that randomly loses people's work and/or suffers major changes in design or functionality every other day, is a sure-fire way to assure overload and drive the user away.

There is nothing wrong with small bugs in the system: give the user a place to report them to and fix them as soon as humanly possible. Bugs — or, more positively, 'features' — happen when first implementing something new. It might turn some people off of the network for a while, but they will return once others assure them the network is now stable and safe to upload work to. People forgive bugs, but they do not forgive implementing something that clearly is not ready to be implemented.

Empowerment

Most of the previous points of involvement are 'passive', but as one can see, passive involvement is a relative term. It is used to indicate decisions or actions which do not need constant management. Instead, they can be implemented once and adjusted should the need arise. When implemented to everyone's satisfaction right away — a rare occurrence — they need not change further. Empowerment has a passive element, but the majority is active. Active empowerment comes from training users to use the network and making them feel they are in control of it, not the other way around. It comes with promoting the network and giving people a chance to get used to it, to adopt it in their own time, as well as giving them a chance to safely discover the network without running the risk of breaking it or embarrassing themselves in front of the entire company.

Passively, we can support empowerment as well, by hardwiring it into the technology. When a program gives tips and tricks about its use, or asks if you're sure you want to perform an action, it empowers the user to experiment — knowing they can always cancel the action in a warning pop-up — and to trust that the technology is 'looking out for them'. Manage permissions so nothing vital can be broken by unsuspecting newcomers, and make people available to answer questions about the network, within the network.

Remember that not all users are inexperienced; experienced users will become irritated with too many warning messages and too few permissions to manage their network as they see fit. It's the balance that counts, as well as the possibility to turn off all these helpful guides once the user understands the network.

What matters is that, when given enough time, encouragement, and clear benefits for the user, the adoption of the corporate social network will go smoothly and Information Overload can be avoided.

Conclusions

Communication Professionals know that managing Information Overload is of vital importance to the successful implementation of a corporate social network. Its relevance and influence is also tied heavily to the network in question and any conclusions about the threat of Information Overload can be made only by evaluating the reception, the integration, and the adoption rate of the network itself. Whether the company has already implemented a corporate social network, or if it's in the planning stages, keep in mind the following about Information Overload:

▸ It should be in the back of your mind with every executive decision about the network

▸ It impacts the reception and acceptance of every decision you make within the design, the implementation, and the internal marketing of the network

▸ It does not impact every user: it depends greatly on the user's ability to apply filters to the information coming through the network

▸ You can aid users by designing a network that is relevant, stable, integrated with other networks, that builds on existing digital knowledge, and that allows for low-threshold tinkering and experimentation

▸ Information Overload is only one possible reason why a network might fail or is adopted slowly

Implementing a corporate social network is a huge undertaking, but one with great benefits to the company and its employees if implemented correctly. Being aware of the dangers of Information Overload is vital for not only the initial integration of the network, but also its continued success. If users are unwilling to adopt the new medium, take a look at the level of noise within your network, and try to decrease it. Noise has its function: it can be the notification light that flashes when attention is required, as well as the feeling of activity that encourages other users to participate, but too much noise leads to Information Overload, and an overloaded user will disengage from the network to avoid that feeling.

How a network is designed will increase or decrease the noise within the channels, but Information Overload is a human thing. The threshold for this overload varies from person to person, and while generalizations can be made for the definition of this threshold, no two people are exactly the same. What matters is that the inexperienced user, as well as the experienced user, is kept in mind during the design and implementation of the network; reducing the risk of overload for one of these groups could potentially increase the risk of overload for the other.

Signs to look out for in spotting Information Overload are:

▸ Disengaged employees

▸ Expressed desire to 'go back to the old way(s)'

▸ Viewing the use of the network as a 'chore'

▸ Questions about basic functionality

▸ Inability of users to find basic functions or files, or to reach the people they want to reach

Information Overload is a real — and often overlooked — thing. As a 'people thing', it's hard to get a grip on, and to design strategies for. The benefits of active noise management are, however, worth the effort and the price for overlooking it is very steep indeed.

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About Atos

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