

MESSAGE OVERLOAD FROM THE INBOX TO INTELLIGENCE ANALYSIS: HOW SPAM AND BLOGS POINT TO NEW TOOLS

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Patterns of responses to “message overload” can be seen in the ways in which people adapt messaging systems and capabilities. Blogging is an effective and increasingly popular decentralized form of group communication that is proving useful in helping people find and share what is informative. We look to blogging for clues to new solutions to the problem of data overload in the world of email. These design solutions to email overload go beyond efforts to block spam, and are based on shifting the basic unit of organization toward communication relationships that allow patterns in communications to emerge.

Message Overload

In a range of settings, message overload has become a serious problem. People are spending more and more effort managing their inbox to cope with an overload of input messages, with little support for stepping back to put things into perspective (Woods et al., 2002). In the field of intelligence analysis we have seen a fantastic growth in the amount of available data without a similar increase in the abilities of analysts to characterize and narrow in on “high-profit” documents (Patterson et al., 2001). As a result, the search strategies of analysts can show a pattern of prematurely narrowing in on a core document set, with little awareness of the potential to have missed important material. Their coping strategies and inadequate tools can force them into situations where important messages are missed.

Email Overload

We see a familiar message overload problem in the world of email. Compounding an overload of email messages is the problem of spam or unsolicited bulk email. As of 2003 almost half the email messages received on the internet were bulk spam messages. We can not blame spam alone for all of our email overload problems. As our dependence on email has gone up, so has the traffic of both spam and legitimate mail. Email overload is no longer just an uncomfortable inconvenience, it represents a crisis that if not soon addressed threatens to undermine the very usefulness of the internet’s most popular application (Werbach, 2002). Legislating away spam is currently being attempted as a strategy to combat the noise, but overload would persist.

Most interfaces to email make it very easy for a spam message to appear as distracting and frustrating.

Spam exists because a small fraction of email users will mistakenly read the messages, and of those, a small fraction will act on them. While the spammers’ margins for profit are thin, the incentive is clearly there. Spammers have learned to very quickly adapt their message styles to defeat the latest spam filter mechanisms offered by anti-spam filter services. Some spam filters work very well but not perfectly, and no filter can guarantee that legitimate messages will not be targeted for removal (Jacob, 2003; Leyden, 2002). Our “sense of spam” comes not only from bulk spammers but also in a new breed of spam, mockingly called “fram” (spam from friends). This type of frustrating overuse of mail is spam too, and points out the problem with most spam filtering schemes (Graham, 1999).

Filtering Spam as False Paths

We question whether the reliance on strategies of automated message filtering and removal is appropriate in an age when connectivity expands our ability to communicate in new ways. Automated reduction is no silver bullet for message overload (Woods et al., 2002). The problem is one of organization – the need to shift from messages to relationships as the unit of organization.

In an effort to organize message traffic, it is increasingly common for people to take on multiple and even many separate email addresses (Guernsey, 2001). This can be viewed as an overload coping strategy, an effort to offload message traffic to multiple addresses in order to isolate and orient to different kinds of relationships. While this strategy is instructive, and may be effective at some level, at the extreme it is a trade off between message overload and address overload.

We argue that many of the proposed remedies to our email overload situations can themselves be read as

symptomatic of a larger breakdown in how we conceive of operating within message based systems (Potter and Woods, 1991).

The WebLog

In the midst of increasing email overload in the past few years, we have seen the rise of the “weblog” as a structure for online communication.

On the surface a weblog is no different than any other web page. What defines a page as a weblog is the format or framework that organizes the content. While sometimes the line between a web site and a weblog is fuzzy, there are some properties of blogs that are clear. Weblogs typically represent the voice of a single person and are updated frequently. Weblogs are organized chronologically with the newest post appearing at the top of the page. Weblogs are typically generated with easy to use software tools that automate the creation and updating of the blog. Each blog entry will often contain a “permalink” address so that others can easily reference and link to that specific post in their own blogs (Hourihan, 2002, Ito, 2003).

The Blogosphere--Organizing Relationships

Blogs are more than just easily updated web pages. A blog usually connects to a network of bloggers where each author will read the output of a number of others. Blog posts can share commentary on events in the world, point to other blogs, or link to content on the internet. A Weblog will often have a section for linking to the favorite blogs of the author.

A weblog opens up a space for building relationships. To the author of a weblog, it represents the space where she relates publicly to the world via her own broadcast channel accessible to all. To the reader of that blog, it is a space to relate to and learn about the author’s interests, expertise, and a place to find information or entertainment (Ellis, 2002).

The chronological structure of the content on a weblog allows readers to quickly become familiar with the personality of the author. When new posts appear, they do so within the context of the entire unfolding history of the author’s words and links. The context that builds up in the blog is always implied, but the author can also explicitly link to older posts to provide directed context.

The linking architecture of the weblog community provides a structure around which relationships can be formed and where conversations and commentaries can grow. Collectively blogs point to each other, forming a web of relationships that can be traversed, quickly guiding readers to the “right” content. The network naturally directs attention, guiding users to new relationships and new content, feeding the cycle of adding value back to the network.

For the blog readers, this group linking activity adds up to an efficient way of dealing with the low signal to

noise ratio on the internet. The commonalities in links between members of a blogging community begins to point the whole group (and everyone else) neatly towards interesting content in the world, acting as a high speed distributed search engine. The network of bloggers quickly becomes a valuable knowledge management tool as participants in the community all seem to quickly learn “who knows what about what” (Nichani and Rajamanickam, 2001).

Evidence to this can be seen in the increasing popularity of blogging in corporate and educational settings, where blogging is being used both for knowledge management and as a “public memory” for people working in groups. People are abandoning email and mailing lists for this purpose, instead deciding to designate a blog as a shared resource (Cortese, 2003). More evidence comes with the fact that Google, the most successful search engine has recently acquired Blogger.com, the largest Weblog engine (Johnson, 2003).

The Rise and Fall of a Blogosphere Story

Within networks of blogs we see the emergence of large shared story clusters, or “blogosphere stories”. These are the collective shared conversations that emerge out of the activity of a number of blogs referring and responding to each other, and contributing small parts to what emerges as a whole. How do these stories start, develop and end? Previous analysis has been done on the rise, sustain and decay of a number of specific blogosphere stories (Coates, 2003; Hiler, 2002).

Individual bloggers, even the most highly visited, are rarely able to start a blogosphere story on their own. Rather it usually starts when a number of people simultaneously blog about an event in the world.

Next, a number of bloggers will respond and or link to these main hub posts from their own blogs. These response links, whether positive or negative, act as votes. The more interesting a post is to the group, the more connections it will accumulate, causing it to be much more likely to be found. The votes direct the attention of others, but soon become redundant and fall out of public view.

Responses and conversation will continue surrounding a main hub until a major response moves the conversation forward and changes the character or direction of the conversation in such a way as to become the new central hub of the conversation and indicator of a new phase in the exchange. Again this is decided by the vote links that emerge across the blog network.

This new phase of the conversation represents a new anchor, or paradigm within the conversation and will continue until an ending summary is drawn up, or until another shift is made, anchoring the conversation once again in a different location (Jenkins, 2003).

Blogging as a form of group conversation differs from the form taken in threaded discussion groups and in email. These types of messaging produce long chain-like

strings of messages where people respond to a main post, then responses to responses will accumulate and build.

Some have said that blogging is simply exhibiting an order that we saw at the beginning of the world wide web, before the “attention economy” was dominated by relatively few search engines and portals. Indeed it can be shown that when ranking the most popular weblogs by the amount of incoming links, a power law distribution can be seen (Shirky, 2003). This suggests that it is merely a matter of time before a few blogs become mainstream and overshadow the vast majority of other blogs. Others argue that networks of bloggers use links in several different ways, giving rise to many local maxima. The different kinds of links stem from the different types of networks that are simultaneously supported by blogging (Mayfield, 2003).

Many small creative networks form the bottom of the blogging chain. Conversations start out local among the strong ties of a tight group of peers. When a conversation moves in the direction of interest to a larger social network of blogs, it may trigger a “weak tie” connection to the larger group where it is picked up and linked to (Granovetter, 1973). If the information continues to resonate at this social level, it may be passed up to a still higher level of organization and linked to by one of the few globally significant and heavily visited weblogs. As content is passed to higher and higher levels of networks, it always retains its permalink back to the source.

It is the ability of blogs to operate at several different levels simultaneously that makes them powerful. The chatter that happens among peers in a small network is selectively processed from the higher level networks in that only socially significant information is passed up the chain. Likewise, the social network scans many blogs and passes information up the chain to the political networks. The structure of the network of relationships allows noise to be naturally suppressed and relevant information to be naturally highlighted.

Blogs as Signs of New Organizational Directions

What we see with blogging is not a technological advancement, but rather a shift in architecture, a shift in organization and a shift in how people think about sharing content on the internet. People are no longer thinking of web content only in terms of pages. The structure of a blog allows people to think of content in terms of paragraphs, and even single sentences. In the chronological context of a blog, a single short post can take on much more meaning than it would on its own.

Bloggers have a unique advantage compared to the big centralized portal sites. The cost of running a portal means that visitors must be exposed to as many revenue generating advertisements as possible. Portals have big incentives to keep each visitor on the site for as long as possible, shuffled from page to page within the site, and exposed to new ads along the way. Blogs do the opposite,

almost immediately referring visitors to content elsewhere on the web (Bunn, 2001). For the blogger, the hope is to become a trusted point of view, a relationship that provides a real-time outlook on what's happening on the internet and in the world right now.

Whereas blogs are oriented towards relationships, email is still fundamentally centered around the message (really half of a message). When we use email, we must track in our minds (if not in our filters and folders) the conversations taking place, as well as the history and tone of the relationships these conversations support. Our email interfaces fail to support these mental landscapes, instead showing us simple packed lists of messages. We interact with email on “message by message” basis whereas with weblogs we act on a “relationship by relationship” basis. What we see with email overload is users having to “attend” to an increasingly burdensome number of messages. What we see with blogging rather is people “attuning” to the world around them (Southwick, 2002).

Blogging is not however, a replacement for email. Blogs are public and operate under the broadcast metaphor, the reader having to pull the content from a site. Email is more geared towards private communication, pushing a message from one person to another. While email and blogging are different, they are in some ways a team. Most bloggers place their email address on their site, allowing people to mail them with reactions to content, as well as ideas about new links and stories to place on the blog. Contents of email conversations are often rapidly folded back into the content of the weblog. Despite their differences, there are some aspects of blogging that email can learn from in helping its users cope with increasing message traffic.

Email users are trying to track relationships in a fundamentally element (message) driven architecture, while bloggers use messages to populate their “relationship space”. In a weblog, over time one can recognize the shape of the conversation, see the contours of the landscape built up by posts. In an email inbox one can only see a packed list as messages pile in from everyone. Organizing email messages into folder categories introduces complexity and rigidity, while using the inbox alone can leave people at the mercy of a deluge of messages.

Relationship Channels

Email can re-frame itself so that relationships become the main unit of organization. To do so we must move beyond the packed list as the main form of interaction with our mail. We propose the re-framing of the inbox using a blog-like metaphor where each relationship is given a time structured channel. After defining a relationship, any message applying to the relationship “populates” or appears in that channel. If a message applies to a number of relationships, it may appear in a number of relationship channels. The actual message need not actually be copied or moved into relevant channels, but

instead can associate itself with as many relationships as is appropriate. The original messages can be left separate in a master library containing all incoming mail. In contrast, current interfaces put users in the awkward position of having to decide how and whether to file message into categories, or to primarily rely on the inbox as a central location for everything (Mackay, 1988; Whittaker and Sidner, 1996). Having the ability to organize in multiple ways allows users to adopt different organizations at different times and for different tasks (Gwizdka, 2002).

In the same way that messages can apply to multiple relationship channels, the channels themselves should be able to be grouped in a number of different ways. Users should be able to cluster and re-cluster relationships, forming different points of view. For example, when starting a project, a new “view” could be created that contained all the relationship channels relevant to the project. This would not, however, impact other points of view that might also contain some of the same relationships.

To depict these relationships effectively means to show their progression over time. A packed queue of messages only illustrates the order in which the messages appeared. Time must still be inferred by reading the date information. To allow the visualization of trends in relationship spaces, we look toward the timeline as an effective and easily understandable temporal frame of reference for structuring our channels (Potter and Woods, 1991). Viewing channels over time allows users to explicitly see not only activity, but the lack of activity in a relationship. A packed list is always packed, leaving no room for illustrating variations in rhythms of activity.

When we move to a relationship channel based organization scheme, we are faced with new challenges. What happens when a legitimate email arrives that does not yet fit into a relationship? Mechanisms to suggest possible relationships will be important. This shifts the focus of the technology from filtering bad messages to finding or suggesting connections that place messages in relationship channels or as candidates to start new relationships.

An End to Spam

Re-framing email as time based relationship channels has the capability to re-define spam. Since users rarely have explicit relationships with bulk spammers, mail from them falls through the channel structure. Messages that do not fit into the communication landscape start to drain away. As these messages slide toward a section of the interface that operates as a “drainage pan”, active software needs to be able to suggest possible relationship channels in a visible way so that users can see new relationships and the messages which start to define them. Seeing messages as they start to drain away in bundles of possible relationships helps users to discriminate emerging new relationships of value from background noise.

Sophisticated mechanisms will still be valuable, but not as filters to guard against bad content. Instead they act to highlight possible communicative relationships and direct attention to potentially good content. In this new framework where the user organizes relationships, spam, as opposed to message traffic about legitimate relationships, simply will have nowhere to go where it can be in the way. Spam becomes not only less bothersome but ineffective as a contact strategy. Much more importantly, the concept of relationship channels provides a means to visualize our changing communication space.

Multiple Cuts Through Relationship Space

Communication landscapes have complex shapes and contours whose subtleties can only be understood when viewed from multiple vantage points. By allowing email users to look at multiple slices through their relationship space, the actual and changing shape of the landscape can be apprehended. The work of visualizing relationship spaces is offloaded from the mind of the user to the eyes. Interacting in conversations and maintaining relationships becomes in part the composition of a visual image of the user’s communication landscape.

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