

Information overload: implications for healthcare services

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Information overload is not a new phenomenon: the potential for it has existed ever since information became an important input to any human activity. For example, once the scientific disciplines began to clearly emerge in the seventeenth to the nineteenth centuries, it gradually became impossible for anyone to keep abreast of all of the work in what had been called 'natural philosophy'. In some fields, the degree of specialization is so high that, even within the same discipline, people are unable to keep abreast of all subareas and, in fact, may be completely unable to understand some of them. This paper defines and analyses the phenomenon of information overload and seeks to present organizational therapies that address it.

Keywords

Information overload, email, information technology, management, managerialism

INTRODUCTION

Throughout the twentieth century, the explosion of information outputs in the form of journal papers, patents, books, 'grey' literature and so forth continued and that explosion gained even more force in the period immediately following the Second World War. Arguably, it was the release of formerly secret information from both Germany and the Allies that resulted in the birth of information science. Nearly 40 years ago Price showed the exponential growth of scientific journals and of abstracting journals, which constitute a small part of the total information to which a person may be exposed (Fig. 1).

By the 1970s, the phenomenon was being discussed in other fields, such as accounting, information systems and communication research [2], with contributions from, for example, Driver and Streufert [3], Farace *et al.*, [4] and Davis and Olson [5]. More recently, however, the business information

providers have taken an interest in the subject, since it is in their interests to ensure that the information load on managers and executives is not so great as to preclude use of their services.

The *Dying for Information* study [6] is one of a series from Reuters, which appears to attribute overload to business factors and the technology:

The amount of information has increased for a number of reasons: there is a general increase in business communication, in-company and with customers and suppliers; trends such as globalisation and deregulation increase competition; companies are downsizing and fewer secretaries are employed to protect people from information; more outsourcing means a wider range of other companies with which it is necessary to communicate. There are also more ways to communicate: by fax, voice mail, e-mail, internet and online conferencing, in addition to the more traditional methods, telephone, meetings, post and telex.

This quotation identifies a number of factors related to information overload:

- increased communication
- globalization
- deregulation
- downsizing
- technology.

The Reuters report also identified some of the effects of overload, specifically:

1. *Time is wasted* – 38% of managers surveyed reported wasting substantial amounts of time looking for information;
2. *Delayed decision making* – 43% of respondents thought that decisions were delayed or adversely affected by the existence of too much information;
3. *Distraction* – 47% of respondents reported being distracted from their main tasks;

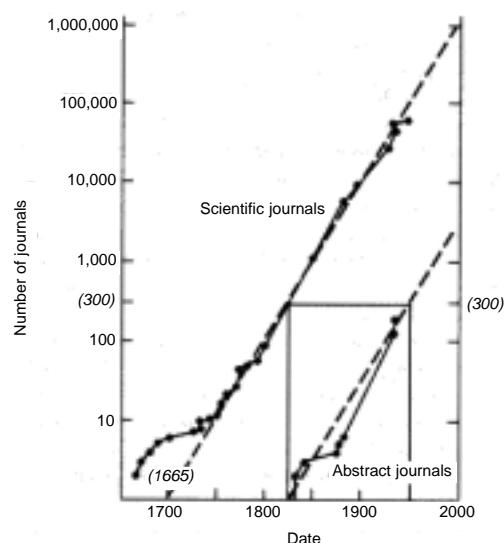


Fig. 1 The growth of information [1]

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4. *Stress* – leading to tension with colleagues, loss of job satisfaction, ill-health (reported by 42%), reduced social activity (61%), and tiredness (60%).

Definitions

At the personal level, we can define information overload as: a perception on the part of the individual (or observers of that person) that the flow of information associated with work tasks is greater than can be managed effectively, and a perception that overload in this sense creates a degree of stress for which his or her coping strategies are ineffective.

Similarly, at the organizational level, information overload is defined as a situation in which the extent of perceived individual information overload is sufficiently widespread within the organization as to reduce the overall effectiveness of management operations.

TECHNOLOGY AND INFORMATION OVERLOAD

Overload has become a 'fashionable' problem today largely as a result of the way information and communication technologies have made it easier and easier to transfer information from one person to another and to make available ever-increasing information resources in almost every field. The technologies include email, voice mail, mobile phones, the Internet and organizational intranets. The potential now exists for these technologies to be mis-used, rather than being used effectively and productively. For example, some email systems, like Microsoft's Outlook Express, allow you to 'Reply to all' at the click of a button: this means that a message saying that X is not able to attend a planned meeting will be sent to everyone on the mailing list of the original message, when only the organizer of the meeting actually needs to know. The 'Reply' function may also resend all attachments and the entire message file, including all to and from messages that make it up – i.e., the 'history' of the file.

As a result, technology is blamed for causing information overload, but, of course, technology is not to blame; the problems lie elsewhere, technology merely provides the channels and mechanisms through which information is distributed or accessed.

If we define technology simply as the means whereby things are done in an organization, then meetings also figure largely as a

'technology' that can lead to information overload. In his training film *Meetings, Bloody Meetings* John Cleese demonstrates how badly organized and run meetings increase frustration and consume more time than would otherwise be needed. The amount of time that senior executives in any organization spend in meetings is enormous; in a study of the social work sector, for example, we found that senior staff spent an average of 17 hours a week in an average of 12 meetings [7].

The role of technology in information overload is expressed by Heylighen [8]:

Part of the problem is caused by the fact that technological advances have made the retrieval, production and distribution of information so much easier than in earlier periods. This has reduced the natural selection processes which would otherwise have kept all but the most important information from being published. The result is an explosion in often irrelevant, unclear and inaccurate data fragments, making it ever more difficult to see the forest through the trees. This overabundance of low quality information, which Shenk [9] has called 'data smog', is comparable in its emergence and effects to the pollution of rivers and seas caused by an excess of fertilizers, or to the health problems caused by a diet too rich in calories. The underlying mechanism may be called 'overshooting': because progress has inertia, the movement in a given direction tends to continue even after the need has been satisfied. Whereas information used to be scarce, and having more of it was considered a good thing, it seems that we now have reached the point of saturation, and need to limit our use of it.

The need for policy

Whether technology is totally or only partially to blame for the experience of information overload, it is clear that organizations need to institute some policy on appropriate use of technology, together with training, in order to limit its damaging effects.

In fact, a training policy might be the best policy: very little training is given in the use of email, voice mail and other technologies. For example, I spent some time in a major company a few years ago and was given voice-mail training – it consisted of half an hour of talk with overheads and no practical experience at all. In our own university, training in the use of a new telephone system (including voice mail) was given in about a one-hour session, but, because of hold-ups in the implementation, some three months before the system was installed. By this time, the training had been forgotten and, as far as I am aware, new

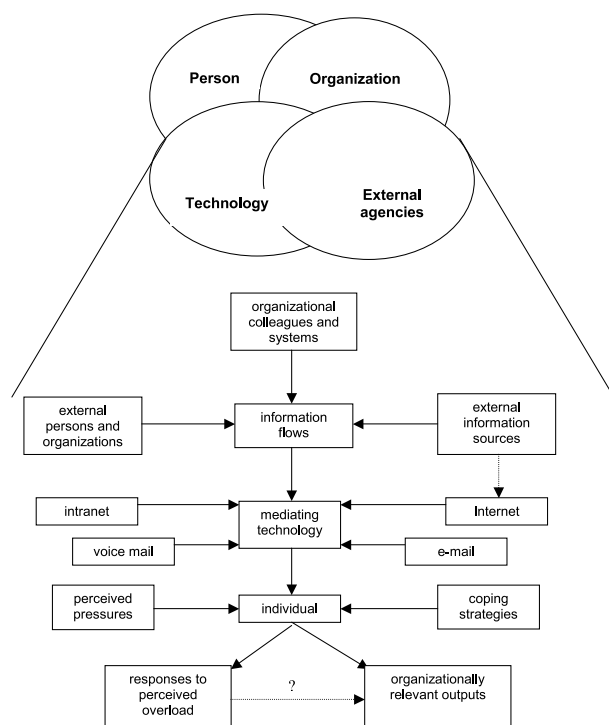


Fig. 2 Factors involved in information overload

members of staff do not undergo any training at all in the use of the system.

Yet it is very easy to specify the kinds of training needed, simply by correcting bad practice. In the case of email, for example, we can identify the following poor practices:

- using 'Reply to all' instead of 'Reply', when only the sender needs a response;
- using 'Reply' when the message is from a mailing list and response to an individual is needed;
- sending to mailing lists instead of to specific individuals;
- signing up to mailing lists, whether relevant or not.

No doubt there are more. Even a short 'Code of Practice' could be enough to change behaviour.

PERSONAL TRAITS AND INFORMATION OVERLOAD

Clearly, however, information overload is not simply a matter of there being more information available, or of the power of the technology to deliver more than we actually need. Human factors also enter the situation in terms of the propensity of people to demand information and to disseminate it to others – information pull and push, in computer jargon.

Information pull is related to what researchers have called the need for cognition [10], that is the extent to which people feel a need to structure and understand their life-world and who seek information to do this. Cacioppo and Petty devised a need for cognition scale upon which individuals could be ranked according to their desire for such understanding. Given that management is 'knowledge work', we can hypothesize that managers will be high in need for cognition and, consequently, will tend to acquire information. A key point is that, the more uncertain their life-world, the more they will be driven to do this.

A pathological state of information pull exists when a person feels impelled to collect information, whether relevant to his or her situation or not.

Information push has a particular technological meaning in relation to the Internet and 'push technology' exists to facilitate the distribution of information. Experience with this technology leads to the conclusion that 'In general, push works best when it's used for information that must be accessed and acted on immediately' [11] and companies that have employed push technology have withdrawn its use, replying upon information pull – employees accessing information when they need to.

However, anyone can act as an 'information pusher', simply by disseminating paper or electronic documents. When this is done on a 'need to know' basis, it may not become problematic, but, again, pathological states of information push may exist for various reasons.

ORGANIZATIONAL FACTORS AND INFORMATION OVERLOAD

The reasons for the pathological states of information push and pull may be found in the work organization. Our research, although at an early stage when this paper was written, suggests that organizational factors such as management style may have greater responsibility for these pathological states than either the sheer volume of information or the power of the technology.

The first point to be made is that modern organizations, especially business organizations, have become enormously stressful places in which to work. Senior managers earn their bonuses and their promotion or movement from one organization to another on their impact on the 'bottom line'. Terms

such as ‘delivering shareholder value’ and ‘increasing market share’ are associated with aggressive managerial styles. People become ‘human resources’, to be moved or dismissed according to the market conditions, or simply stock-market sentiment.

The impact of management fads

In business and increasingly in the public sector, this urge for efficiency (often at the expense of effectiveness) has been driven by one management consultancy fad after another. We can go back to the time and motion studies of Taylor in the early part of the twentieth century, which were associated with the idea of ‘scientific management’; following this we had the ‘human factors’ school in the 1940s and 1950s, associated with the Hawthorne experiments and researchers such as Maslow and Hertzberg, followed by ‘management by objectives’, PPBS (Planning, Programming, Budgeting Systems), ‘zero-based budgeting’, the ‘learning organization’, ‘business process re-engineering’, and now ‘knowledge management’. All of them promoted the Utopian ideal that success depended upon applying these ideas throughout the organization.

At the same time as the later of these fads were prevailing, we have also had the phenomenon of ‘downsizing’, that is cutting the staffing of an organization to an irreducible minimum, usually presenting to the downsized staff a picture of imminent collapse, while at the same time presenting a rosy future to shareholders. Although downsizing is thought to have run its course, in fact it appears to continue unabated. Stephen Roach symbolizes the changing sentiment towards downsizing.

Downsizing was alleged to improve productivity, increase profitability and in some respects, to ensure the health of the overall economy by hampering inflationary expectations (via wage inflation). Stephen Roach, Chief Economist at Morgan Stanley, was a strong protagonist for downsizing, arguing that it was the cure for any company’s problems, but in 1997 he reversed that opinion, arguing that, on the contrary, it could be a recipe for industrial disaster. Yet as market sentiment runs against the TMT (Technology, Media and Telecommunications) sector, we find major companies laying off thousands of workers.

Jenkins [12] reports Kim S. Cameron, a researcher in organizational behaviour, as saying that, ‘downsizing [is] the most pervasive yet unsuccessful change effort in the business world’ and:

In the end, a corporation almost always loses company memory and company energy. The first is caused when informal networks are destroyed, information sharing is restricted, and experienced employees depart. The second is caused from declining morale, loss of loyalty and commitment, and the departure of the most talented employees, who know they are marketable.

When these effects are felt pathological information behaviours occur as workers seek to defend their jobs: they hoard information, they ‘syndicate risk’ (as one of our interviewees called it) by informing absolutely everyone who might have any conceivable interest in a project well before it comes to the decision stage, and they insist on being kept informed about anything that might conceivably affect their work, and indeed about many things that will not.

Conflict between risk and stability

I see this aberrant behaviour as a conflict between senior executives who seek to promote an ethos of risk-taking and change, and the ordinary workers and middle managers who look for stability and security. This situation is represented in Fig. 3.

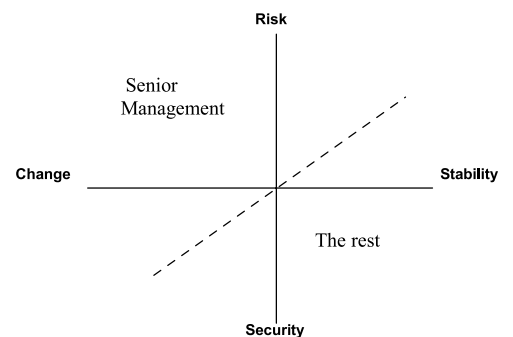


Fig. 3 The risk/security, change/stability problem

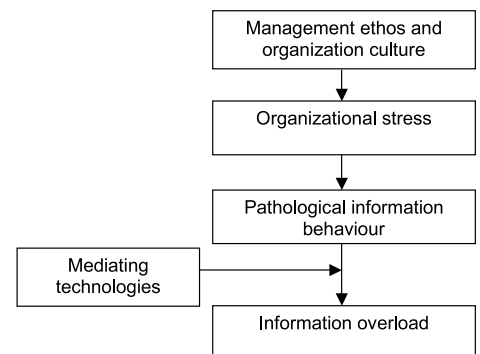


Fig. 4 An organizational model of information overload

IMPLICATIONS FOR HEALTH-CARE SERVICES

In many, if not most countries, healthcare is a combination of private and public sector activity, with the balance varying depending upon the political ideology prevailing at any time. In the USA, for example, the private sector is much more dominant than it is in the UK, where the National Health Service, although far from perfect, is regarded by the population at large as one of the main achievements of the Labour government of 1945 and where attempts to privatize are strongly resisted. The attempts continue, however, and the Thatcher and Major governments of the 1980s and 1990s made vigorous attempts to create a private-sector ethos, through artificial forms of competition.

The result has been an increase in 'managerialism' (a phenomenon which has also infected the university sector), which is also known as New Public Management (NPM). Fitzsimons [13] notes, in relation to education:

Under NPM, there is an elaboration of explicit standards and measures of performance in quantitative terms that set specific targets for personnel, an emphasis on economic rewards and sanctions, and a reconstruction of accountability relationships. It promotes a reduction in scope for ministerial discretion in the administration of government agencies, it separates the funding agencies from providers of services as well as separating advisory, delivery, and regulatory functions. NPM introduces accrual accounting, capital charging and a distinction between the state's ownership and purchasing interests. There has been a decentralization of management control towards what is often referred to as the doctrine of self-management. In the interests of so-called productive efficiency then, the provision of educational services has been made contestable; and, in the interests of so-called allocative efficiency, state education has been marketised and privatised.

The impact of NPM on general practitioners in the British National Health Service has been reviewed by Warwicker [14] who found that it resulted in a loss of clinical autonomy, increased central government controls and tensions between the management of care and its delivery.

The 'new managerialism' brings with it, inevitably, all of the management consultancy fads that, in my view, cause such problems in the business world and, of course, the greater the involvement of the private sector in the

delivery of healthcare, the greater the associated risks. For example, it has been reported that 'downsizing' has made its way into the largely private sector healthcare of the USA, with grave (apologies for the pun) effects:

In the health-care field, for instance, researchers in two studies involving 571 hospitals found that patient mortality rates increased by 400 percent when staffs were reduced by 7 percent [12].

In other words, managerial style and management fads are just as likely to cause the same kinds of stress in healthcare as in business, if the focus shifts from the effectiveness of service, which is a costly business, to efficiency, which is more about meeting political promises of lower taxes than anything else.

Modern information technology is almost as ubiquitous in healthcare as it is in business, although its penetration and use has been limited to some degree because of fears about the security of systems and the confidentiality of, for example, patient records. However, this series of symposia has shown how much impact the technology is making in many areas of healthcare and in many countries.

Given these two facts and the wider availability of electronic information in general we can assume that the same stresses will produce the same kinds of aberrant information behaviour as occur in business.

CONCLUSIONS

Information overload is not *simply* a matter of there now being more information available than people can readily acquire, process and learn from, although it is probably true to say that more jobs now involve day-to-day access to many more kinds of information than was the case, say, 50 years ago. However, people in some areas have had to cope with the problem for more than 100 years, and have adopted coping strategies (such as greater degrees of specialization) that enable them to do so.

Nor is information overload *simply* a matter of information and communication technologies making the acquisition and dissemination of information much easier than used to be the case. It is true, however, that the misuse of technology (the most obvious example of which for most of us is advertising email 'spam') does contribute to the problem, particularly if people are not given any training in its proper use or in strategies to cope with misuse.

In my view, the root cause of information overload is the stress created by modern management practices which put people's jobs

under threat, or which increase the general workload, or otherwise create defensive behaviour. This leads to information behaviour that creates overload on the individual him/herself and/or on others. The management ethos creates a culture of blame, which works against the desire for change and risk-taking and, in the process, the organization loses part of its information base as a result of stress-related diseases, redundancies and the best qualified people moving to positions in other organizations where the stress levels are lower.

What can be done in this situation? To get to the root of the problem involves more organizational actors than the information professional. Senior and middle managers need to be involved and the problem needs to be on senior management's agenda. Some guidelines can be offered, however, simply by reference to the previous analysis:

1. Determine whether or not there is a problem of information overload in your organization and whether the analysis presented above applies.
2. Recognize stress-related behaviour, ensure that senior management is aware of the problems it causes and seek to ensure that those affected are properly counselled.
3. Advocate the development of an information strategy for the organization, or, if one already exists, ensure that it is not simply an information technology strategy, and that the issue of overload is considered.
4. Promote effective training in the use of email, voice mail, the management of meetings and the distribution of documents.
5. Monitor email traffic to locate the 'nodes' that generate most traffic or that fail to use approved methods, or that generate unnecessary attachments to messages.
6. Engage in good information behaviour yourself. In particular, if you are an information provider, disseminate information selectively according to established need, not through distribution lists that generate load for others. Promote information access rather than using 'push' technology.

The message is a short one: to overcome organizational pathologies we need organizational therapies.

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