

EDITOR'S COMMENTS

The Grim Reaper: The Curse of E-Mail¹

In 1982, I spent a happy and productive sabbatical leave at New York University. While I was there, I had my first encounter with electronic mail. New York University was one of the early nodes on the Internet. Colleagues within the Department of Information Systems had embraced the new technology quickly. Through necessity, I soon became an adept user of e-mail.

A colleague of mine who is an accountant often reminds me of a conversation he had with me when I returned from New York University to the University of Queensland. During our conversation, I explained the nature of e-mail to him. He recalls his scepticism about e-mail and his belief that it was just another technological fad that would be short-lived. Subsequently he became a dean of a large faculty. Like many of us, his life now seems ruled by e-mail. He often speaks publicly about his early comments to me on the likely success of e-mail as an example of how wrong we can be when we try to predict the future.

Nowadays, it is common for me to receive between 50 and 150 e-mail messages in a single day. I am on few mailing lists. Moreover, little spam mail gets through the filters that my university uses. In short, much of the e-mail I receive is substantive. Some can be dealt with fairly quickly. Some requires several hours of work to provide an appropriate response. From conversations with many colleagues, I know my situation with e-mail is not atypical.

For many of us, I suspect we have a love-hate relationship with e-mail. On the one hand, we could not accomplish many tasks without e-mail. For instance, I now maintain frequent, productive interactions with many colleagues around the world. My life has been much enriched through these interactions. I know that I could not sustain these interactions if I had to rely on surface mail, airmail, or telephone conversations. Some tasks I now do also would be difficult, if not impossible, in the absence of e-mail. For instance, the management of a journal like the *MIS Quarterly* is much easier with e-mail.

On the other hand, e-mail now imposes some high costs on our lives. For some time, I have been attempting to better understand and to articulate these costs. I sense e-mail has wrought some deep changes in my life both professionally and personally. I know many colleagues have this sense too. If we are seeking the Internet's "killer application," in my more-cynical moments I've come to the conclusion that e-mail is it. Both literally and figuratively, I now view e-mail as truly a "killer" application! Some days, I feel the deluge of e-mail will be the death of me.

My goal in these editorial comments is twofold. First, I am seeking to motivate more research on e-mail. In my opinion, we lack a deep understanding of the impact that e-mail has had on our lives. Increasingly, I believe that both the professional and personal impacts on us have been profound, yet our understanding of these impacts remains fragmented and superficial. Similarly, I feel we lack a good understanding of the impacts of e-mail on groups and organizations. The situation is akin to our early understanding of the

¹I am indebted to several senior editors and Gordon Davis for helpful comments on an earlier version of this editorial. Responsibility for the content, however, lies with me.

impacts of personal computers on our lives. We thought we understood the impacts, but we are still witnessing changes wrought by personal computers that we had never anticipated.

Second, I feel strongly that we need better ways of managing e-mail and assisting users of e-mail to deal better with the problems it poses. Somehow we have to devise and enforce protocols that will result in senders of e-mail messages reflecting on and evaluating better the impacts that their messages might have on the receivers of their messages. We also need to help receivers of e-mail messages cope more effectively with the amount and types of messages they confront. Knowledge workers, in particular, require assistance. They are major users of e-mail. They are also responsible for managing their own productivity. Knowledge workers need to understand those e-mail practices that enhance their productivity and those that undermine it. They also need to be familiar with and capable of using technologies that will assist them to deal effectively with e-mail. If they work as members of an organization, the information systems function within the organization also must be well placed to support them. In short, we have human, technological, and in some cases organizational problems to solve.

In the sections below, I have examined briefly some phenomena associated with receivers and senders of e-mail that I consider to be problematical. I seek your indulgence if what follows appears to be a litany of woes in relation to e-mail and perhaps somewhat satirical. I fully understand that e-mail has both benefits and costs. You will see quickly, however, that in this editorial I have taken a somewhat jaundiced view of e-mail. I have done so purposefully to try to show that e-mail phenomena provide a rich lode to mine for research purposes. Curiously, we have little published research about e-mail in our major information systems journals,² even though for many of us it represents perhaps the most-significant computer application we use. In this light, I hope to motivate more high-quality research and more high-quality publications on e-mail.

Some Professional Impacts of E-Mail

Perhaps the most-obvious impact of e-mail on our work life is that many of us now spend large amounts of time dealing with the messages we receive. From one perspective, the problem is simply the number of e-mail messages that require our attention. In-bound messages take time to read. Often our organizations require that we keep them on file rather than delete them. Similarly, our own work needs may mean we have to keep and file them. As a consequence, we have to decide where the messages should be filed. We must then transfer the messages to an appropriate mail-folder. Often responses to in-bound messages must be composed. Copies of responses may have to be kept and also filed appropriately. All these activities take time.

If we receive on average 100 messages per day and each message on average requires one minute to handle (most likely, an optimistic estimate of the time required to handle each message), we will require on average 100 minutes of uninterrupted time each day to clear our in-box. For many of us, days that have 100 minutes of uninterrupted time are rare or non-existent. As a result, e-mail backlogs build up quickly. Recovering from the backlog soon becomes impossible. The consequence is that the backlogged messages remain unanswered.

²For example, one of the few instances published in the *MIS Quarterly* is Allen S. Lee and Ojelanki K. Ngwenyama, "Communication Richness in Electronic Mail: Critical Social Theory and the Contextuality of Meaning" (21:2), June 1997, pp. 145-167. Allen and Ojelanki reanalyzed data on e-mail use collected by M. Lynne Markus in some pioneering work she had undertaken.

From another perspective, the more-salient problem is the increased pace of work that e-mail has produced. E-mail enables faster communication among individuals. As a result, work can be done faster. I suspect that many of us now do much more work in a week than we did prior to the existence of e-mail. Of course, whether this work ultimately is effective is another matter. For many of us, however, the number of e-mail messages we receive is secondary to the pressures we now feel as a result of a faster work life. In my view, e-mail-related stress has become a major problem for many colleagues.

Some messages received require substantial amounts of time to generate an appropriate response (e.g., a request to review a paper or to undertake an evaluation for a tenure-and-promotion case). As the number of these types of messages increases, responding to all messages received becomes impossible. When I first encountered this situation with the messages I was receiving each day, my initial response was to read each of the messages quickly and to try to prioritize them. My goal was to respond to at least the high-priority messages. In a short period of time, this strategy failed. I had insufficient time to undertake even a quick scan of all the messages I was receiving. Thus, I was unable to prioritize them. For the most part, I now scan the names of senders and message headers as a basis for choosing the messages that I will read. The result is that important messages sometimes are overlooked.

In an attempt to cope with the large inflow of e-mail messages, I know that some colleagues now have an assistant first read all the messages they have received. The assistant culls some messages, files others, responds to some, and prioritizes the rest. The benefits of using this strategy are clear, but there are also costs. First, substantial amounts of human resources are now devoted to processing e-mail. Second, the assistant may or may not make good decisions about the ways messages should be handled. Third, senders of messages do not incur costs associated with non-responses to their messages. They become less circumspect, therefore, about whether they should send a message in the first place. As a result, they continue to send low-value messages.

Some Personal Impacts of E-Mail

Beside the substantial professional costs that many colleagues now bear as a result of handling e-mail, the personal costs are high. Many colleagues have indicated to me that they can no longer take weekends off or enjoy a vacation. If they do not spend several hours each day attending to their e-mail, it becomes impossible to recover from the backlog that quickly develops. They complain of high stress levels that arise when they do not attend to e-mail each day.

Similarly, many colleagues have complained to me about the frustrations they frequently experience as a result of e-mail when they travel on business. Their days are often heavily committed with meetings. Rather than not attend to their e-mail, however, they spend time in the early morning or late at night reading and responding to their e-mail. Because they must sometimes use low-speed telephone modem connections, they require extra time to attend to e-mail. Moreover, my own experience is that in some countries the so-called high-speed hotel Internet connection is slower than the telephone modem connection I use at times in Australia. The seemingly increasing numbers of colleagues who send e-mails with large attachments (e.g., PDF files containing graphics and images) do not help the situation. For many colleagues, therefore, e-mail contributes significantly to the overall exhaustion they now feel when they travel. They have little time to relax and recuperate.

For many of us, e-mail has obfuscated the boundary between work and non-work. In this regard, I have had colleagues' family members complain to me about the impact that e-mail is having on their lives. They

contend that colleagues are addicted to e-mail—that they spend countless hours of family time attending to e-mail. The result is that the quality of family life and social life more generally declines sharply. Some family members and friends allege that fundamental breakdowns in interpersonal relationships have occurred as a result of e-mail. I suspect they are right.

Problematical Behaviors Among Senders of E-Mail Messages

Among colleagues who send e-mail messages to me, I have observed a number of problematical behaviors. Unfortunately, at times I realize to my dismay that I am guilty of these behaviors myself.

Perhaps the most-problematical behavior we exhibit as senders of e-mail messages is that we do not consider carefully the costs we impose on the recipients of our messages. Many e-mail messages are easy to compose and send. Because we do not bear the full costs associated with sending a message (the receiver bears some of the costs), basic economics predicts that we will over-produce messages. My casual empiricism indicates that this outcome indeed occurs. For instance, if we are seeking assistance on a matter, sometimes it is easiest to broadcast a message to multiple recipients in the hope that someone will respond. Our own needs take much higher priority than others' needs.

Among colleagues who are intensive users of e-mail (and unfortunately also with myself), I frequently observe a syndrome that I call "e-OCD-ADD" (e-mail obsessive-compulsive disorder combined with e-mail attention-deficit disorder). The obsessive-compulsive behavior is manifested when colleagues feel they must *always* deal with e-mail and act as though it is absolutely imperative they deal with it *now*. They *must* respond to e-mail and respond quickly. Otherwise, their sense of self-worth is undermined. The attention-deficit behavior is manifested among colleagues who configure their e-mail systems to sound an alarm when a new message arrives. Upon hearing the alarm, they feel compelled to at least look at the message header and perhaps to read and respond to the message. They cease whatever task they are undertaking to attend to the newly arrived message. Indeed, face-to-face communications with a colleague can stop mid-course to attend to the e-mail message. (I have observed a similar syndrome with mobile/cell telephone users.)

Another syndrome I have observed I call "BFD" (brain-finger disconnect syndrome). With this syndrome, a person's fingers somehow seem to be able to type a response to a message with little engagement on the part of the person's brain. As a result, the response may or may not bear some relevance to the content of the message that the person has received. BFD is evident when providing a fast response to a message somehow seems to have assumed a higher priority than reading the message, understanding the message, and providing a thoughtful reply.

Some colleagues also use e-mail as a signaling mechanism. For example, I have colleagues who clearly compete in terms of how quickly they respond to e-mails. It seems they believe that the speed of their responses is somehow a measure of their worth as a colleague. They especially like to respond to messages quickly when they are sent at odd hours of the day or night or at weekends. It shows they are always "on the job." Unfortunately, my experience is that many colleagues who exhibit this behavior also appear to suffer from e-OCD-ADD and BFD (see above).

In a similar vein, some colleagues frequently send messages to a list-server to signal their expertise or at times it seems simply to signal their presence in the community that uses the list-server. In this regard, my experience with list-servers is that the distribution showing the number of messages sent according to their

source is often sharply skewed. The costs imposed on others by colleagues who use the list-server as a means of signaling can be high. Moreover, if all members of a list-server used it as a signalling mechanism, its usefulness to the community that it is intended to assist would be undermined severely.

I have also had colleagues use e-mail as a weapon against me. They have taken umbrage with a decision or action of mine. In response, they have then unleashed on me a steady, frequent stream of angry, abusive messages. They are fully aware that they are adding to my already-overloaded in-box and thus eroding the time I have available to spend on other matters. Moreover, relative to a face-to-face exchange on the issue that irks them, they know they can sustain their attack for a much longer period with e-mails. I believe they also understand that it would be much harder for them to continue the conflict if we were to meet face to face.

E-mail sometimes seems to bring out a colleague's *alter ego*. I know some colleagues who are supportive, cordial individuals during face-to-face interactions. They take on another personality, however, when they compose and send e-mails. Their messages tend to be curt and aggressive, and at times they are downright abusive. It is difficult to reconcile the two faces of their communications. This is the e-JH (e-mail Jeckyl and Hyde) syndrome.

Some e-mail senders are "workload bouncers." This problematical behavior can take several forms. For instance, rather than undertake basic, straightforward work themselves, some colleagues will simply broadcast a message to others seeking a solution to the problem they are facing. Similarly, when some colleagues receive a work request that they could handle themselves, they forward the request to others. E-mail obviates the difficulties they are likely to encounter if they had to explain their actions in a face-to-face situation. Receivers might be exasperated by the work request, but many will simply do the work rather than engage in conflict.

Some colleagues use e-mail messages to provide a detailed audit trail of events pertaining to some topic. At every step, they send a message recording their understanding of the situation and perhaps asking for confirmation of their understanding. When a dispute arises, they produce a file of messages and point to a particular message to demonstrate that their interpretation of the "facts" is correct. Alternatively, if someone has failed to understand some aspect of the situation or neglected to take some action, they point to a message they have sent explaining the situation or requesting the action be taken.

Clearly, having an audit trail of events pertaining to a topic can be useful. When it is used as an offensive or defensive mechanism, however, relationships among colleagues can break down. Some become frustrated with the large number of messages being transmitted. Some soon realize that the messages might be used as an offensive or defensive weapon and begin to read each message carefully. Disputes about even minor details become more frequent, which further adds to the e-mail overload. Some colleagues become angry when e-mail messages are used to justify one's position in a dispute. Some withdraw from interactions with colleagues who use e-mail messages in this way.

Many colleagues also use a genre with e-mail messages that is different from the genre they use with hard-copy letters. For instance, they do not use a salutation or a complimentary closing followed by their name with their messages. Grammar, style, and spelling also may be lax, and the overall tone of the message may be terse and informal.

Many of us are comfortable with using e-mail in this way. We see it as a means for quick communication. Moreover, we might change our genre depending on whether we are sending a formal message or an informal message to a colleague. Different cultures have different expectations about the genre to be used

in written communications, however, irrespective of whether we are using a hard-copy message or an e-mail message. The receiver may take the absence of a salutation or an informal tone as a slight and thus be offended. Unless we are sending messages to well-known colleagues, we need to be sensitive to cultural differences when we compose e-mail messages.

Some e-mail senders are "generals." They use e-mails to give instructions or orders to their colleagues. The courtesies in their messages, if any, are minimal. They constantly tell others how something should be done, or they maintain a barrage of questions asking why something has not been done.

Generals in academe often focus on journal editors as a target for their messages! They ask frequently and brusquely why the editor is not handling their papers in an "appropriate" way. Ironically, generals often have a poor reputation themselves because they have a history of failing to follow "orders"—for instance, they are slow, unwilling, or unhelpful reviewers of submissions by their colleagues to journals or conferences.

Over-courteous colleagues can also cause problems with e-mails. They send many thank-you messages and the like. Considered in isolation, these messages seem innocuous. In the context of a large inflow of other messages, however, they can be the straw that breaks the camel's back.

Similarly, courtesy-copy e-mail messages can cause major problems for receivers. These messages arise when colleagues send copies of e-mail messages to a third party. The third party might be the sender's superior or someone they feel should know about their communications. Perhaps in the past the sender had suffered the consequences of not providing someone with a copy of a message they had sent. For instance, they might have raised the ire of a superior or colleague who felt they had a right to see a copy of an e-mail message that had been sent. Given the low cost of providing a copy of an e-mail message, the sender then concludes it is better to be safe than sorry. Unfortunately, in the context of a large inflow of other e-mail messages, the courtesy-copy messages may be the receivers' undoing.

Problematical Behaviors Among Groups Using E-Mail to Communicate

Among pairs or groups of colleagues using e-mail to communicate with one another, I have observed patterns of communication that at times appear pathological. These patterns undermine the effectiveness and well being of individuals. They also undermine the effectiveness of groups and organizations.

At one extreme are "flame" wars. Someone sends an aggressive or abusive message. A receiver takes offence and responds in kind. The original sender again responds, this time with an even more-aggressive or more-abusive message. Others might then be drawn into the exchange. They too may begin to send aggressive or abusive messages. The "heat" in the communications escalates, peaks in due course, and then begins to dissipate. Eventually a truce is called or communications cease because the protagonists have become exhausted. In the meantime, however, countless hours may have been wasted in the exchange. Moreover, some relationships among colleagues may have been damaged irreparably. Additional resources may have to be expended to try to undo some of the damage that has occurred as a result of the exchange.

While flame wars are not unique to e-mail exchanges, e-mail weakens the effects of factors that otherwise would act as deterrents. When letters have to be typed and sent by surface mail, a cooling-off period is enforced naturally by the technology. The costs of preparing a letter are also higher than typing and sending a response via e-mail. Moreover, prior to e-mail, it was more difficult to engage others in a heated exchange. In short, I suspect flaming is more prevalent in an e-mail environment.

Some groups using e-mail to communicate also fall victim to the "see-see" (carbon copy) syndrome. A message is sent from one individual to another individual with copies sent to a number of other individuals. If the see-see syndrome has taken effect, the copies are sent primarily for two purposes.

First, the sender wants to signal that he or she has done some work or is a fast responder to e-mail or has expertise in some area. In other words, the main purpose of the message is self-promotion to colleagues other than the designated primary receiver of the message. The carbon-copy list often is chosen strategically. For instance, it includes the sender's superior, other senior colleagues, or peers who are opinion makers or possess power of some kind.

Second, the sender wants to engage others in a dispute. If this is the dominant purpose, again, the carbon-copy list often is chosen strategically. It includes the sender's superior or other senior colleagues, peers who have well-known positions about the matter in dispute, peers who take sides quickly in a dispute, and peers who are prone to engage quickly in flame wars.

When the see-see syndrome is in full flight, the carbon-copy list attached to e-mails grows quickly, sometimes exponentially. The receiver replies to the message with automatic copies to all individuals on the sender's carbon-copy list. In addition, the receiver adds one or more individuals to the carbon-copy list. Once more, the additions to the carbon-copy list often are chosen strategically. The receiver who is responding to the original message in turn wants to undertake self-promotion as a form of retaliation to the sender's efforts at self-promotion. Alternatively, the receiver seeks to marshal support for his or her own position in the dispute that is the subject matter of the original e-mail message.

When the original sender receives the response from the receiver with an expanded carbon-copy list, he or she in turn replies with an even longer carbon-copy list. Some individuals on the carbon-copy list then begin to engage in the exchange of messages (assuming the original sender and receiver have made astute choices about whom to include on their carbon-copy lists!). They in turn increase the number of individuals on the carbon-copy list. The number of messages and the number of individuals engaged in the exchange grows quickly. Like a flame-war exchange, the communications escalate, peak in due course, and then begin to dissipate. In the meantime, often considerable resources have been expended on the exchange, little has been accomplished, and relationships among individuals have been damaged.

Senders of e-mail messages who are prone to subtle, sophisticated signalling and manipulation of others often fall victim to the blind see-see syndrome. They are driven by Machiavellian tendencies. Carbon copies of e-mail messages have been sent to others, but the receiver is unaware that this situation has occurred. The result is a set of subsequent e-mail or face-to-face interactions with others that the receiver does not understand fully.

Among groups of colleagues, e-mail sometimes leads to a marked decline in the frequency and quality of face-to-face communications. For most of us, it is much more difficult to sustain aggressive, angry, or abusive communications if we must do so in the physical presence of the person who is the focus of our communications. If the other person remains calm and does not retaliate, we soon begin to feel foolish if we maintain our angst. It is difficult to continue a one-sided verbal argument. If the other person does retaliate, however, we bear the full force of the retaliation through multiple senses. The response is not confined to the content of an e-mail that we can choose to read or to ignore. The personal costs we bear are high.

My experience is that individuals who lack good interpersonal skills or who are aggressive, arrogant individuals often use e-mail to communicate with their colleagues rather than engage in face-to-face

communications with them. They are also prone to broadcast their messages to other colleagues, seemingly in an attempt to inflict maximum damage on the colleague who is the focus of their aggression or anger. Sometimes, the aggressive, arrogant individual has an office in close physical proximity to the colleague who is the focus of their e-mail communications. In one case where I observed this behavior, the aggressive, arrogant individual had an office next door to the colleague who was the focus of their e-mail communications.

In short, e-mail protects individuals who seek to engage in and sustain inappropriate communication behaviors. As a result, these individuals quickly undermine the quality of relationships among a group of colleagues. Face-to-face communications become difficult because they must be carried out against a backdrop of angry, aggressive, or abusive e-mail messages. Consequently, rather than engage in face-to-face communications, colleagues withdraw. They retreat to their offices, or increasingly they work remotely. The group exists in name only; effectively it is a collection of isolated individuals.

Some Technological Challenges Associated with E-Mail Communications

Perhaps technological solutions exist to some of the problems that I have attempted to articulate above. For example, better voice input systems would allow receivers of e-mail messages to compose replies faster, better filtering systems would assist users of e-mail systems to prioritize messages they receive faster, and e-mail systems that have learning capabilities might assist with filing and archiving of messages based on the content of message lines or the message itself.

Systems that monitor the overall pattern and content of message interactions among e-mail users could also be beneficial. For example, such systems might detect problematical behaviors among e-mail users—content that manifests a possible flame war, long carbon-copy lists, aggressive and abusive messages, excessive use of courtesy messages, excessive use of e-mail by particular individuals, and so on. In some cases, they might block e-mail exchanges among a group of users pending review by another person such as a senior manager or some type of mediator. In other cases, they might delay the transmission of messages where they detect content that might be problematical. The delay would enforce a cooling-off period that would allow the sender of a potentially problematical message to retract the message if they had a change of heart.

Some functions within existing e-mail systems also need to be improved considerably. For instance, large numbers of out-of-office messages can be generated when one e-mail system responds automatically to an out-of-office message sent automatically by another e-mail system with its own out-of-office message. E-mail systems need to be capable of identifying messages that have been generated automatically by another e-mail system and to take appropriate action when they receive such messages.

Similarly, some e-mail systems automatically send “courtesy” messages to the senders of virus-infected e-mail messages. In many cases, however, the person who receives the message never sent the message in the first place. Instead, another computer that was infected by a virus sent the virus-infected message. These courtesy messages clutter up e-mail in-boxes, add to the problems of e-mail overload, and do little to resolve the problems caused by viruses.

At one time, also, I received a rash of e-mail messages asking me to check my contact details (as contained within the message) and to respond with any changes to these details. Initially, I replied to these messages because I thought they were personal requests. Eventually, I realized that the messages had been

generated automatically. I then saw that I had little knowledge of many of the individuals who were requesting me to check my contact details. Somehow my details had ended up in their address books. The technology was helping one person at the expense of another person.

In our efforts to improve e-mail technology, however, we need to take care that we do not exacerbate problems with e-mail use. For example, if technological developments reduce the costs of filtering messages, filing messages, and composing replies to messages, use of e-mail may increase because receivers are better placed to deal with a larger number of messages. Similarly, if technological developments enable us to automatically curb problematical behaviors among groups of e-mail users, individuals in the group may become less circumspect about the messages they compose and send.

Somehow, technological developments need to reinforce and reward appropriate behaviors and curb and penalize inappropriate behaviors among e-mail users. Of course, resolving what constitutes appropriate and inappropriate behaviors then becomes a difficult issue. For a start, important ethical and legal considerations have to be addressed, such as the extent to which (1) one person's or one group's value systems should govern communications among others, and (2) legal rights are compromised through different types of technological monitors and inhibitors. I believe technological developments associated with e-mail use therefore need to be informed by social science research. Otherwise, these developments may prove to be ineffective.

Some Conclusions

For many of us, e-mail use is a major facet of our professional and personal lives. We spend more time using e-mail than any other computer application. In spite of e-mail's importance, however, I believe it is an under-researched topic within the information systems discipline. I am aware that e-mail phenomena are increasingly becoming a focus for researchers in other disciplines.³ In no way do I wish to detract from the importance of this research carried out by colleagues in other disciplines. Nonetheless, many of us claim that as members of the information systems discipline we are well placed to study phenomena associated with human-computer interactions. It is somewhat ironic, therefore, that with few exceptions we find little research on e-mail published in our major journals.

I hope these editorial comments motivate consideration and articulation of major research themes pertaining to e-mail that we might explore. One such theme could be the development of a taxonomy of e-mail user behaviors. In a somewhat wry, sardonic way, I have outlined different types of behaviors that I have observed as a casual but nevertheless committed and interested observer of e-mail use. In more-formal ways, we need to study e-mail user behaviors, classify these behaviors in some meaningful way, and identify how frequently the various types of behaviors occur. In particular, I believe the nature and incidence of problematical e-mail behaviors require special attention because of the costs they now impose on individuals, families, and organizations. Nonetheless, we also need to understand the behaviors of highly effective users of e-mail so we can document and learn from these behaviors.

A second research theme could investigate the reasons why e-mail users manifest different types of behaviors, especially problematical behaviors. I suspect a complex set of individual-difference, group,

³For example, the journal *Human-Computer Interaction* currently has a special issue in process on "revisiting and reinventing e-mail." The themes of the special issue are information and task management, managing relationships with people, awareness and identity, users and uses, enabling tools and technologies, and research methodology.

organizational, task, and technological factors at times are at play. If we better understood how these factors interacted and underpinned the emergent behaviors we observe when individuals communicate via e-mail, I believe we would be better placed to influence and to manage these interactions.

A third research theme might involve the design and implementation of technologies that improve the effectiveness and efficiency of e-mail interactions. In this regard, it would be helpful if we first understood how existing e-mail technologies are used. We currently have little understanding of the merits of the different functionalities provided by current e-mail technologies. Moreover, as I have indicated above, I believe we face a conundrum with research that aims to improve e-mail technology. If the technology allows users to become more-efficient users of e-mail, the consequence might be that we undermine the effectiveness of e-mail use. The reason is that improved technologies reduce the costs for the users who perpetrate problematical behaviors. Thus, researchers who undertake design and implementation work need to be circumspect about the user behaviors that their technologies might evoke.

A fourth research theme might be aimed at articulating improved protocols to guide our behaviors when we use e-mail. I suspect all of us already have some understanding of these protocols. For instance, many of us have learned quickly the dangers of attending to e-mail at those times during the day when our concentration and creativity levels are at their highest. Also, I suspect that all of us have some understanding of the protocols we should use in our e-mail interactions with others (appropriate use of copies, subject lines, etc.). With improved understanding of e-mail phenomena, however, we ought to be able to develop improved personal and organizational protocols for e-mail use. We also would be more confident in the appropriateness of any measures we use to enforce use of these protocols.

A fifth research theme might study the effects of e-mail on individuals, groups, organizations, and society. I believe we have appropriated e-mail in all sorts of interesting ways. As a result, we now observe fundamental changes in our workspaces and social spaces. In some cases, the outcomes have been beneficial; in other cases, they have been detrimental. In particular, we need to understand how e-mail has enabled workspaces to encroach on social spaces and the resulting impacts on our lives.

A sixth research theme might investigate economic incentives that we can put in place to elicit effective and efficient e-mail behaviors among individuals and groups. For instance, in my frustration at times with colleagues whom I perceive send too many messages to a list-server, I have wondered about the consequences of giving each member of the list-server a yearly endowment of messages that they are allowed to send. This endowment might be based on the number of users of the list-server (with a larger user base, each user's endowment would be smaller). The list-server would then monitor the number of messages sent by each user and prevent a user sending further messages once their endowment was expended. I have also contemplated schemes whereby the whole or part of one's endowment might be auctioned.

More generally, I believe the e-mail "marketplace" poses some interesting problems for those of us who sometimes like to frame information systems phenomena from an economic perspective. In my view, the externalities associated with e-mail use at times result in serious market failures. Designing mechanisms that will provide incentives for e-mail users to engage in behaviors that lead to improved social-welfare outcomes provides some challenging problems.

I am sure that other major research themes associated with e-mail use can be identified. Those above are intended to be illustrative only. I hope they provide some motivation, however, for more of us in the information systems discipline to engage in research on e-mail phenomena.

Special Issue on Action Research

I am delighted to indicate that this issue of the *MIS Quarterly* is devoted entirely to the topic of action research in the information systems discipline. Following my comments here, the senior editors for the special issue, Richard Baskerville and Michael Myers, provide an excellent introduction to the special issue. They describe the motivation for the special issue, the nature and conduct of action research, and the ways in which the papers published in this special issue contribute to our knowledge and understanding of action research and information systems phenomena.

On behalf of the *MIS Quarterly*, I would like to extend my sincere thanks to Richard and Michael, the associate editors, the reviewers, and the authors who submitted papers to this special issue for all their hard work. Some authors also deserve our congratulations because they have had their papers accepted for publication. I am confident this special issue of the *MIS Quarterly* will do much to enhance our understanding of how action research can be used productively in our discipline.

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