Intel’s War on Information Overload: A Case Study

Jonathan B. Spira
Chief Analyst

Cody Burke
Senior Analyst

August 2009
“Intel's War on Information Overload: A Case Study” copyright © 2009 Basex, Inc.

All data, opinions, and projections in this report are based on Basex’ judgment at the time of publication and are subject to change.

All rights reserved under International and Pan-American Copyright Conventions. No part of this report may be reproduced or transmitted in any form, by any means, without the express written permission of Basex.

Basex, the Basex logo, Knowledge. Analysis. The Right Decisions For Your Business, Collaborative Business Knowledge, Collaborative Business Environments, KWIQ and Knowledge Worker Impact Quotient are all trademarks or registered trademarks of Basex, Inc. All other trademarks mentioned in this document are the property of their respective owners.

ACKNOWLEDGEMENTS

Editorial Direction: Basílio Alferow
To remain competitive, businesses need access to information and the strategic advice to use it wisely.

That’s why many organizations turn to **Basex**

Basex is the world’s foremost authority on the issues companies face as they enter the knowledge economy.

[www.basex.com](http://www.basex.com)
## CONTENTS

**INTRODUCTION** ........................................ 1

**INFORMATION OVERLOAD AND INTERRUPTIONS** ............. 3  
  Interruptions and Recovery Time ......................... 3

**WHERE DO THE INTERRUPTIONS COME FROM?** .................. 6

**INFORMATION OVERLOAD PROGRAMS AT INTEL** ................ 8  
  Early Efforts ........................................... 8
  Recent Information Overload Initiatives .................. 10

**QUIET TIME** ............................................ 12  
  Unexpected Results ..................................... 17

**NO E-MAIL DAY** ......................................... 19

**E-MAIL SERVICE LEVEL AGREEMENT** ......................... 25

**A DIFFERENT APPROACH** .................................. 28

**HOW DO WE DEAL WITH INTERRUPTIONS?** ..................... 29  
  Perceptions .............................................. 29
  Expectations ............................................ 29

**RECOMMENDATIONS** ...................................... 31  
  Steps the Knowledge Worker Can Take ................... 31
  Steps an Organization Can Take .......................... 33

**TEN STEPS TO HELP MANAGE INFORMATION OVERLOAD** .... 37  
  E-Mail ..................................................... 37
  Instant Messaging and Presence Awareness ............... 37
  All Forms of Communication ............................... 37
INTRODUCTION

For the knowledge worker, each day is filled with demands on his time. From colleagues stopping by to discuss both work and social matters, attending scheduled and unscheduled meetings, and the constant stream of electronic communication from e-mail and instant messages to tweets and texts, the ability to focus and accomplish tasks in today’s work environment is constantly being challenged.

Information overload, a problem that results in an inability to concentrate on tasks and stay focused, is a massive problem in the twenty-first century; recent Basex research shows that Information Overload costs the U.S. economy ca. $900 billion per year. A large part of that figure is the cost of unnecessary interruptions and resultant recovery time. Recovery time can be as much as ten to twenty times that of the original interruption.

The tools that knowledge workers use turn out to be the source of many of the interruptions that cause them to lose focus; e-mail, instant messaging, and phone calls all provide distractions, yet all are also indispensable to work. The knowledge worker’s perception of how these tools affect his productivity is often inaccurate, leaving him unaware of the disruptive effect that all these interruptions may be having on his day.

Since 2003, Basex has interviewed and surveyed over 5,000 knowledge workers at over 1,000 companies worldwide in order to generate a general understanding of the dynamics at play in terms of how knowledge workers are using their tools, how distractions and interruptions affect their work habits, and how workers can effectively maximize the utility of technological tools while minimizing their invasive and often counterproductive nature.

A few pioneering companies became aware of the impact that interruptions and distractions are having on their bottom line early on. One such organization, Intel, started to address these issues as early as 1995 and attempted to instill e-mail etiquette and usage strategies. Since then, Intel has experimented with e-mail usage programs, Service Level Agreements (SLAs) to reduce expected response times, and pilot programs aimed at providing uninterrupted time and reducing e-mail overload.
Before commencing with a recent round of pilot programs, Intel conducted employee surveys to better understand the participants’ work environment. The data from those surveys paints a picture of a team of knowledge workers that suffers from symptoms of Information Overload, including a dearth of uninterrupted time to complete tasks and the absence of clear strategies to deal with the problem. The data provide an important snapshot that illuminates both the range of sources of distractions and the information sources that workers encounter during their workday, as well as how they are dealing with them.

This report explores the sources of information and interruptions that the knowledge worker encounters on a daily basis, as well as the efforts that Intel has undertaken to confront the resulting Information Overload and lost productivity.
Information overload describes an excess of information that results in the loss of ability to make decisions, process information, and prioritize tasks. Even as information increasingly functions as the principal currency of our society and economy, knowledge workers are faced with a damaging overabundance of it.

In the course of a typical day, a knowledge worker may receive hundreds of e-mail communications, instant messages, phone calls (from both land and mobile lines), and text messages, not to mention the vast amount of content that is presented in other forms.

Information Overload decreases knowledge workers’ effectiveness and efficiency and causes diminished comprehension levels, compromised concentration levels, and reduced innovation. It can also further exacerbate health issues that are starting to become common amongst knowledge workers. According to a 2008 Basex survey, 35% of knowledge workers experience work-related back and/or neck pain, carpal tunnel syndrome, eyestrain, headaches, or other stress related symptoms.

Technology has enabled us to interrupt one another with unprecedented frequency and generate information on a mass scale in the form of e-mail, instant messages, text messages, Web pages, discussion forums, RSS feeds, wikis, blogs, phone calls, letters, magazines, and newspapers. At this point in our technological development, we have become far more proficient in generating information than we are in managing it. In addition, we have created myriad new technologies that easily allow us to create new information without human intervention, further exacerbating the problem.

Unnecessary interruptions plus recovery time consumes an average of 28% of the knowledge worker’s day (based on surveys of high-level knowledge workers conducted by Basex in 2004 and again in 2006). With a knowledge worker population of ca. 65 million, this means we are losing a staggering 36 billion person-hours each year in the U.S. alone.
The term “recovery time” describes the time it takes the knowledge worker to get back to where he was prior to the interruption (not merely to restart work) and can take ten to 20 times the duration of the interruption. For example, a 30-second interruption might result in five minutes of recovery time although, in some cases, the knowledge worker might not return to the original task that day; when and if it is restarted later, the penalty (i.e. recovery time) will be far greater.

Because of the increasing number of interruptions, getting work done often requires finding a place without a phone or Internet connectivity; until recently an airline seat would suffice, but that is no longer guaranteed. In a 2005 survey by Basex, multiple respondents reported taking drastic measures to work unmolested. Examples include retreating to conference rooms, drawing the shades, turning off the lights to avoid detection, as well as going to cafés that are far away from their office so no one would bother them.

Knowledge workers do have some measure of control as to how people interrupt them. They can exercise this control by setting the appropriate presence state on their instant messaging client (e.g. away, do not disturb, not available) or putting up a do-not-disturb sign on the office door or entrance to the cubicle.

It is important to note that not all interruptions are created equal. With apologies to George Orwell, some are more equal than others. Depending on the source and context as well as the parties involved, some interruptions may indeed be very important while others may simply be unnecessary and just disruptive. A complete discussion of interruptions is beyond the scope of this report; for an in-depth look at this topic, the reader is referred to The Cost of Not Paying Attention: How Interruptions Impact Knowledge Worker Productivity.

Ultimately, the perceived value or cost of an interruption is a personal matter; an interruption for the interruptee is not necessarily an interruption for the interrupter. In addition, many people have difficulty determining whether a matter is important, urgent, both, or neither. A question may be important, but not time sensitive, and hence not urgent.
Likewise, someone might perceive an issue to be urgent, but it might not necessarily be important.

Further, there are relative degrees of importance that the knowledge worker must consider:

- **Personal importance**: How important is this issue to me?
- **Group importance**: If other people are involved in the process, how important is the issue to them?
- **Organizational importance**: How important is the issue to the problems with which the organization is dealing?

Technology has dramatically increased the problem of interruptions. Even as recently as 20 years ago, only two of five typical distractions common today (desk phones and visits from colleagues, versus instant messages, e-mail messages, and mobile phones) were technically feasible. Taking steps to counter such distractions was easier (calls could be forwarded to voicemail and a door could be closed with a do-not-disturb sign posted). Now knowledge workers have to contend with RSS feeds, Twitter tweets, BlackBerry Messenger, and Facebook updates, as well as near ubiquitous access to information through mobile devices.

Over the past decade, the world has seen tremendous changes in the ways people work and there’s more to come. For example, e-mail, closely followed by instant messaging in some circles, has become a staple of communications both internally and externally. By 2006, 40% of the knowledge worker population was working from non-traditional, non-Dilbertian environments, ranging from home offices to hotel rooms, and from airport lounges to customer sites, on a regular basis. That figure will grow steadily over the next decade. Indeed, at IBM alone, each day 40% of the company’s workforce works outside of IBM offices.

In addition, much more so than even five years ago, co-workers and colleagues can be located across time zones and national borders, not in the adjacent cubicle. Companies have yet to fully integrate cultures with different languages and customs, but as the circle of coworkers increases, the next interruption may come from 10 time zones away and outside the normal workday, upsetting a delicate work/life balance.
WHERE DO THE INTERRUPTIONS COME FROM?

Many interruptions are necessary; a knowledge worker is not a solitary figure existing in a bubble. Information from the outside world is what powers knowledge work and it must be obtained one way or the other. Interruptions can provide critical information and function as a catalyst for a break that allows necessary mental recharging. Through a chance interruption, the knowledge worker can also be exposed to new content that may trigger a knowledge accident, e.g. where a connection is made that may have gone otherwise unseen.

Surveys of knowledge workers conducted by Basex in 2006 and 2007 reveal that 88% depend heavily on information obtained from human interactions such as informal discussions, team meetings, and presentations. These sorts of human interactions remain the leading sources of information that the respondents needed to do their jobs.

But some interactions have the opposite effect. They distract the knowledge worker, making it difficult to focus on the task at hand. As a result, many knowledge workers fall into the trap of believing they can multitask their way through distractions, but in reality all they are doing is time slicing, flitting back and forth between tasks, never devoting their full attention to any of them. In his book CrazyBusy, Edward Hallowell, a Massachusetts-based psychiatrist who specializes in the treatment of attention deficit/hyperactivity disorder, calls multitasking a “mythical activity in which people believe they can perform two or more tasks simultaneously.”

Disruptions come from a variety of sources, each with its own unique characteristics. Common sources include:

**E-mail (checking, reading and responding).** Can be checked at a user’s convenience; however, expectations of rapid response cause interruptions by conditioning users to frequently check their inbox.

Surveys at Intel in 2007 showed that employees receive more messages via e-mail than any other communication source. 30% report they received between 21 and 50 e-mail messages a day. Among managers, 58% received a minimum of 50 a day.
Not surprisingly, 70% of managers thought e-mail overload was definitely a problem; half of those considered e-mail to be a big problem.

**Meetings.** Face-to-face and virtual meetings are essential to conducting business, but they are also prone to overuse and often break into a knowledge worker’s thinking time.

Nearly half of the Intel managers surveyed had one to two uninterrupted three-hour blocks of time scheduled without any meetings per week. An additional 35% had none. While engineers had slightly greater blocks of time free per week, it is clear that all of those surveyed spent a large amount of time in meetings, and that their schedules did not allow for significant uninterrupted periods during which they could think and concentrate on work.

**Face-to-face conversations.** This includes scheduled and ad hoc meetings that can cut into uninterrupted work time as well as casual conversations, such as when someone drops by the cubicle to chat. At Intel, around half of employees had between one and two of each of the following per day: ad hoc meetings, interruptions of a personal nature, and work conversations.

**Instant messaging (IM).** When used properly with presence indicators it can be an effective and efficient communication tool, but it is easily misused; such as when ignoring or not using presence awareness or using IM when another tool may be more suitable, such a quick phone call or an e-mail when the query is not time sensitive.

**Phone calls (landline and mobile).** Out of favor at the moment, phone calls can be more effective than e-mail in certain situations and, with the addition of mobile phones, can reach knowledge workers at virtually any location (for better or for worse).
EARLY EFFORTS

Since its founding in 1968 by Bob Noyce and Gordon Moore, Intel has been a leader in the silicon revolution, having developed microprocessors that formed the foundation of the PC revolution (the Intel 8088 chip was selected by IBM as the CPU of its first personal computer) and the Internet revolution.

Today, the company is the world’s largest semiconductor chip maker, employing ca. 83,900 people, with 50% of those employees in the U.S. Annual revenue in 2008 was $37.6 billion.

Intel also has a history of developing programs and practices to deal with Information Overload issues for well over a decade, and for good reason. Intel’s own research indicated that each knowledge worker loses ca. eight hours per week due to Information Overload, which for a company its size would result in a cost of $1 billion per year.

In 1995, Nathan Zeldes, who was at that time an IT staff member for Intel in Israel, started developing what he refers to as “first generation solutions” to deal with the problem of e-mail overload. Zeldes traces his work on Information Overload issues to the introduction of IBM PCs to the workplace. The presence and use of the computers quickly created new and unforeseen problems, including that of Information Overload.

Solutions at the time were confined to promoting e-mail etiquette practices and coaching in the effective use and management of e-mail as a communications medium. According to Zeldes, the impact of these approaches would last for about a year or two but then fizzle out.

Early programs in Israel were well received by management which had found itself increasingly impacted by e-mail overload. Then, in 1999, these programs came to the attention of the EMEA (Europe, Middle East, Africa) marketing group, and Zeldes was asked to revive and update the 1995 program. It was then launched as a pilot program in Europe.
Surveys conducted at the time indicated that 71% of participants felt e-mail effectiveness improved as a result of the program and 63% reported seeing positive change in the quality of e-mail from others. Additionally, 75% of managers reported increased worker efficiency after the program. Overall, 80% of the participants said the program was beneficial.

The experience in the EMEA region led to the development of the YourTime program, which was targeted at the entire corporation. This was a top-down program that began at the senior executive level and worked downward. It was comprised of three components; awareness training for e-mail etiquette; discussion sessions within teams in order to pinpoint ways to improve communication and reduce overload; and specific training for the efficient use of e-mail software. The program was implemented through in-person training and a Web-based training tool specifically developed for the program, and was sponsored by the CIO.

Once a group of senior executives was trained, they would then repeat the program for the next highest level of staff, and so on. The overall structure was one of training and behavior modification level by level, so good e-mail habits would be given credibility by driving them top-down. The YourTime program was well received and ran in several areas of Intel, with the lessons and strategies learnt incorporated into new hire training.

Intel also implemented several e-mail etiquette programs, including an e-mail effectiveness coach that utilized pop-ups to prompt users about to send an e-mail with an etiquette error, e.g. when they had forgotten to include a subject or attachment for an e-mail. In a similar vein, the Practice Smarter E-Mail program was a lightweight program that consisted of a sequence of messages reminding users of proper etiquette for e-mail.

Because of the low overhead cost, these programs were resurrected from time to time in various forms in different parts of Intel at the request of local managers. Zeldes was frequently approached by these managers for advice on improving e-mail usage. This in turn led to the development of customized programs based on past experiences and lessons learnt.
Up until this point, the programs implemented by Intel were focused on behavior modification, namely, training people to use tools correctly so they did not overload themselves and their coworkers. Zeldes, when describing these programs, referred to them as “training and indoctrination”; this is an accurate description in that the goal of these early efforts was to teach. Unfortunately, as noted by Zeldes, the messages that these programs reinforce dilute over time, and bad habits gradually work their way back into people’s work styles.

**RECENT INFORMATION OVERLOAD INITIATIVES**

Zeldes discovered through internal Intel surveys that the typical Intel employee was receiving 50-100 e-mail messages daily and spending 20 hours per week handling e-mail, of which 30% (of the messages) were unnecessary. Top executives reported receiving up to 300 messages per day. Intel as a company received on average 3 million e-mail messages a day. These survey numbers were drawn from 2006; it is likely that the numbers are higher now.

In an attempt to avoid some of the pitfalls of past programs, especially the drift that occurs as lessons learnt in the early training programs are forgotten, Intel launched a series of seven-month-long pilot initiatives aimed at combating Information Overload from a different angle. The three pilot programs were:

- **Quiet Time.** This program was a weekly four-hour block of uninterrupted time with minimal distractions for the knowledge worker. The time was to be used as they saw fit, as a break from the constant stream of interruptions that Zeldes felt were compromising efficiency and productivity.

- **No E-mail Day (NED).** This program called for one day during which members of a group would revert whenever possible to higher levels of vocal communication instead of e-mail. The intent was to combat unnecessary e-mail use such as cubicle to cubicle e-mailing in the same office.
E-mail Service Level Agreement (SLA). The E-mail Service Level Agreement was a policy agreement that extended the acceptable time frame for replying to e-mails to 24 hours, instead of the ingrained expectation of an almost instantaneous response that required constant monitoring of inboxes.

Zeldes solicited and received support from senior management for the programs and the manager of a group of engineers volunteered her team for the pilot. The majority of the group was based in Austin, Texas with the remainder working out of Chandler, Arizona. There were a total of 300 engineers in the program, including a sub group of 150 working on a special project. In both locations, team members would work with members in the other location and there were no geographic distinctions in tasks, working styles, or environments. For the most part, the members of the pilot program communicated within their own team, so the effects of communicating with people outside the pilot program who were not adhering to the rules were not considered to be significant.
The Quiet Time pilot was designed to provide knowledge workers with a window of time that would be relatively free of interruption and allow for greater thought and reflection. During this time, workers would use their own discretion as to what to work on. It was expected that many would work on projects that required undisturbed time. (N.B. After the pilot ended, it became apparent that some used the time to organize and catch up on e-mail.)

There were 300 members in the pilot group that participated in Quiet Time, which ran on Tuesday mornings from 8 a.m. to noon. Participants were to set their e-mail client to be offline so they could compose and read e-mail but not receive new messages. Instant messenger presence status was to be set to do-not-disturb, calendars were blocked so meetings could not be scheduled, phones were to be forwarded to voice mail, and do-not-disturb signs were displayed outside of office doors.

In surveys conducted regarding the Quiet Time pilot, significant gaps were revealed between how managers and engineers experienced the pilot program.

When asked at the onset of the program what their expectations for the Quiet Time pilot were, managers were far more likely to have a “wait and see” attitude. The picture that emerges before the pilot began was one of cautious optimism; no resistance or pessimism was evident.

![Chart 1 – Before the pilot, managers and engineers were asked about their expectations for the Quiet Time program. Managers were slightly more reluctant than engineers to express optimism about the program, but none of them thought it would actually have a negative effect.](chart1.png)
Zeldes expected the Quiet Time program to be successful and, based on the number of participants who were in favor of continuing the program, it was. After the pilot ended, 42% of those surveyed said it was at least somewhat effective. Managers in particular had a largely positive reaction to the pilot, and while it wasn’t as popular with engineers, the pilot still received moderate support from them.

Additionally, 71% approved recommending the pilot be applied to other groups, although many supplied caveats or suggested that changes be made first. Managers were more likely to recommend that the Quiet Time pilot be continued for their team (53% compared to 34% of engineers).
Changes suggested by program participants included clearly communicating and enforcing the expectations of the program, particularly at a managerial level, and communicating to outside groups that they need to respect the program. Additionally, the comments indicated that clear rules were needed to define what a legitimate interruption was, and that the program could not succeed as a one-size-fits-all solution; it needed to be tailored to different roles. Many also said that the basic premise, a mandated time for thought and reflection, was flawed, and that the type of work they were doing, coupled with the reality of a globally distributed company, made a mandated quiet time unrealistic.
One worker put everything into perspective: “We should have at least 4 hours per day of uninterrupted time to work, and it shouldn’t have to be a mandated program. People need to be more disciplined in not scheduling and in declining unnecessary meetings. That said, Quiet Time is a step in the right direction.”

Managers and engineers were asked to rate the effect that Quiet Time had had on specific areas of their work as “positive”, “negative”, or “no impact.” The areas they were surveyed about included overall job enjoyment, the ability to innovate and create original value, reduction of e-mail overload, finishing important tasks on time, and the ability to do work requiring concentration.

When asked about specific areas of their work and the effect that the Quiet Time pilot had, only one area, “collaborate with co-workers,” received more negative feedback than positive. Even in this case, only 18% of those surveyed felt that the pilot had a negative impact. Critically, 45% of those surveyed found the program had a positive impact on their ability to do work requiring concentration, which was the goal of the program.

With the exception of overall job enjoyment, where both groups answered almost identically, a higher number of managers consistently felt the pilot had a positive impact and higher numbers of engineers consistently felt the pilot had no impact.
Chart 5 – While Quiet Time was not generally viewed negatively, most engineers felt the pilot had little impact. For managers, the pilot gave them an opportunity to complete work in a timely fashion, find more time to innovate and create value, and concentrate on tasks.

However, it is worth noting that, although the engineers were more likely to report that the pilot had no effect on specific areas of work, 71% of engineers approved of extending at least a modified version of the pilot to other groups.

Interestingly, the number of engineers who felt that their co-workers respected their quiet time actually dropped as the pilot went on. In a mid-pilot survey, 40% of engineers agreed that their co-workers respected their quiet time, 19% disagreed, and 40% were neutral. By the end of the pilot, when asked the same question, 31% agreed, 27% disagreed, and 43% were neutral. That is a ten point drop in the number who felt their quiet time was respected and an eight point rise in the number who felt it was not.
Chart 6 – During and after the pilot, engineers were asked if managers and coworkers respected their quiet time. In the post-pilot survey, the number of engineers who disagreed with the statement actually rose.

UNEXPECTED RESULTS

An unexpected issue arose in that team members were taking the rules too literally. “About two months in when we did our mid survey, we found that people interpreted the prohibition against interruptions too strictly,” Zeldes said, “so if they had a question at 8:30 that prevented them from doing their job they would sit and fume until noon.” When that was realized, the common sense aspect of the program was reiterated; an urgent question could, of course, be asked if necessary, largely solving that problem.

Zeldes was surprised to find that it did not matter what role a team member had; participants used the uninterrupted time differently, in the way they felt was most useful to them. Not surprisingly, although the pilot was more effective for some groups of employees than others, the freedom that all workers had to determine their use of this time led to most people reporting that they had found something beneficial to use the time for.

Zeldes notes that, in follow-up interviews after the program, it became clear that even those employees who required a high level of interaction with colleagues appreciated the chance to think and organize themselves without distraction. Something else that emerged in the follow-up interviews is that many workers also did not like the do-not-disturb door signs, which were seen by some as both somewhat immature and
unnecessary. Workers liked being able to have a time slot to do what they wished, but they did not like heavy handed mandates.

The practice of Quiet Time was extended after the pilot’s completion, and is being evaluated for use in other groups at Intel.
NO E-MAIL DAY

The title of this pilot, “No E-mail Day,” is not entirely accurate; e-mail was still allowed, but workers were encouraged to move around the office and initiate face-to-face contact with co-workers, both to reduce e-mail loads and to encourage the kind of social contact between workers that would improve the quality of intra-office communication. This was the real gist of the pilot, to push team members to use other methods, preferably verbal, to communicate with one another.

No E-mail Day (NED) was run within a 150-person group, not across the whole engineering team. The overall aim was to encourage person-to-person communication and eliminate e-mail that could be easily replaced with an in-person conversation. The program was run on Fridays, with phone calls and in-person communication strongly encouraged. E-mail sent to those outside of the group was allowed, as was critical internal e-mail. The goal was to “encourage voice communication,” says Zeldes, “to fight against the phenomenon of e-mailing across the partition”.

The pre-pilot survey revealed that managers and engineers perceived incoming e-mail differently.

![Chart 7 – Before the start of the No E-mail Day pilot, more managers than engineers perceived e-mail as a significant problem.](chart)

E-mail habits differed somewhat between managers and engineers. 69% of engineers read e-mail as soon as they noticed it, compared to only 53% of managers.
This indicates poor time management habits on the part of the engineers, and only slightly better inbox discipline among managers.

The pilot also presented logistical challenges in that members of neither group were at their desks sufficiently so as to make face-to-face encounters a regular occurrence. This left them in many cases with e-mail as the only means of communication, making it impossible to follow the pilot's directive, thereby limiting the possibility of any positive outcome.

Only 29% of those surveyed after the pilot ended said it was at least somewhat effective. Managers especially did not like the program; only 11% felt that it was even somewhat effective, and not one of them thought that continuing the program was a good idea.

How effective was the No E-mail Day Pilot?

Chart 8 – At the conclusion of the No E-mail Day pilot, the overwhelming majority of people, both managers and engineers, saw the program as not having been terribly effective.
Chart 9 – Despite their feelings on the program’s effectiveness, less than a third of engineers and managers were against continuing the program. The majority of managers and a plurality of engineers were unsure about continuing the pilot and no managers and only 23% of engineers said they would recommend continuing the pilot in their team.

The numbers were similar when responders were asked if they would recommend extending the No E-mail Day pilot to other groups.

Chart 10 – Perhaps more indicative of their feelings about the program’s effectiveness, a clear majority of engineers and managers were in favor of extending NED to other groups in some fashion.

Changes suggested in the post-pilot survey mainly concerned enforcement, with some suggestions to shut down the e-mail server on No E-mail Day to force compliance. Most who responded (not all survey takers answered this question) however, felt the pilot was flawed and unrealistic, particularly during busy periods of work. One respondent wrote, “The basic premise is flawed. Instead teach people which method of contact is most appropriate instead of applying a blanket rule with no consideration of the communication in question.”
Both managers and engineers were asked if the pilot had positive, negative, or no impact on specific areas of their work. Engineers had higher numbers of positive responses than managers in every area, although in general both groups were most likely to say that No E-mail Day had no impact. The most common manager response in all areas was no impact. On the plus side, only a very small number of engineers said the pilot had a negative impact on specific areas of work and no managers felt that it had a negative impact on any of the categories.

Chart 11 - Engineers, who as a group were less dependent on e-mail than managers that were frequently away from their desks, saw the greatest benefit in No E-mail Day.

No E-mail Day was viewed by many with indifference, reflecting the e-mail centric environment of the team. More importantly, it seems to have had little impact on the volume of e-mail compared to other workdays. It is unlikely that e-mail overload can be eradicated by simply discouraging e-mail on one day and not on others. Additionally, the group that piloted the program turned out to be a poor choice; if the program had been run in a more cubicle-based group the pilot might have had more of an impact and generated more enthusiasm.
The effectiveness of the pilot was closely linked to the manner in which the managers and engineers worked. The group of 150 people that participated in the pilot spent very little time in offices and cubicles. For this reason, e-mail was often the only way to contact colleagues; stopping by their desk was simply not a reliable way to initiate contact. And managers, who spend a large portion of their working time in meetings, found it extremely difficult to communicate without using e-mail.

The program’s ultimate impact on e-mail overload was small, but not insignificant; 45% said that the number of e-mail messages they sent on No E-mail Day was lower than on other work days, and 29% said that the pilot had a positive effect on lessening their e-mail overload.

Zeldes noted that the program may be more effective when applied to “teams that are not only collocated, but also tend to sit in their offices most of the day, so your coworker is predictably available to be spoken to synchronously when the need arises.”

Conceptually, the idea of No E-mail Day was similar to Nestlé’s No E-mail Fridays and Computer Associates’ E-mail Breaks, which is to reduce e-mail communication during a mandated time period as a means of tackling e-mail overload. Nestlé’s program, undertaken in 2001, had the unfortunate side effect of doubling e-mail volume on Mondays as knowledge workers created but did not send their messages on Fridays. In the 1990s, Computer Associates went as far as shutting down their e-mail system for several hours each day during which time staff was able to compose e-mail but not actually send it. This had the opposite effect of what was intended, as e-mail would subsequently arrive in great quantities in a short period of time, virtually ensuring that some important messages were overlooked.

At Intel, the goal was to specifically encourage face-to-face and phone communication when it was more appropriate than e-mail. That goal was laudable, but the implementation of these Information Overload initiatives, even in a best case scenario, was an all-or-nothing approach akin to a fasting diet that delivered temporary results that were then lost when eating resumes.
Total withdrawal from a habitual activity or behavior pattern, be it eating or the use of e-mail, for a brief period of time does not result in the behavior modification that is required to achieve the goal of trimming one’s waistline or one’s inbox. In order to change knowledge workers’ attitudes towards e-mail, any behavior modification that is attempted must target the knowledge workers’ behavior around all communications tools 24x7, with an eye towards permanency.
The E-mail Service Level Agreement was a top down service level agreement regarding response times for e-mail. Group members were told that they could take up to 24 hours to respond to e-mail. The intended goal was to reduce time spent managing inboxes and allow workers to check in two or three times a day instead of constantly monitoring their inboxes for fear of missing an e-mail to which the sender expected an immediate response.

Intel felt the need to codify, in a way that would be minimally invasive and distracting, expectations for dealing with information that accumulates. Changing the expected response time was intended to allow participants some inbox breathing room.

Intel employees typically felt under pressure to respond quickly to e-mail. According to an Intel employee commenting on Intel’s IT@Intel blog in response to a post by Zeldes on the pilot programs, “part of the root cause of e-mail overwhelm [sic] is due to the evolution of the response service level agreement within our culture. In my mind e-mail was designed for about a 24 hours service level agreement if not even a bit longer.” The employee went on to note that, at Intel, “We often use it [e-mail] as a substitute for a phone call (or page) and, over time, folks feel tied to e-mail. We need to reset our culture to a reasonable responsiveness timeline.”

The program was implemented across the entire group of 300 and according to Zeldes, “failed miserably at creating any change [in e-mail habits].” Zeldes attributes the ineffectiveness of the pilot to a “culture of urgency” regarding e-mail that is deeply entrenched and resistant to change.

Managers and engineers had markedly different understanding of the terms of the E-mail Service Level Agreement. When asked before the pilot what the current expectation, either expressed or implied, was for responding to e-mail, 23% of engineers said they did not know. By contrast, 100% of management at least had some form of understanding (although this varied by individual) as to what was expected. Even after the pilot, only 4% of engineers, compared to 33% of managers, correctly identified 24 hours as the official E-mail Service Level Agreement.
Clearly, there were significant failures in communicating and following through with the E-mail Service Level Agreement. For example, during the pilot, when asked if having an explicit service level agreement helped to reduce the frequency with which they checked e-mail, only 28% of respondents agreed. By the end of the pilot, that number had fallen to 18%.

Broken down by role, after the pilot ended, 53% of managers said the E-mail Service Level Agreement had helped them reduce the number of times they checked their inboxes, compared to only 12% of engineers.
At the end of the E-mail Service Level Agreement pilot, managers disproportionately agreed that the pilot helped reduce the frequency used to check and respond to e-mail, while engineers largely disagreed or were neutral. This discrepancy suggests very poor communication of the E-mail Service Level Agreement to engineers and shows that engineers felt that managers’ expectations had not changed with regard to the need for quick responses to e-mail messages, despite the official 24-hour response time allowed.

The E-mail Service Level Agreement worked for the people who set the expectations, in this case the managers, but did not work for those to whom the expectations applied. For an E-mail Service Level Agreement to be effective, it has to be driven top down, and management has to lead by example and strongly support it. Engineers have to feel confident that they can avoid responding instantly to e-mail without repercussion, or they will just ignore the service level agreement.

While the e-mail centric culture of Intel contributed to the failure of the E-mail Service Level Agreement, what is more striking is the gap between managers and engineers. For this sort of service level agreement to take root, it is not enough to officially change the explicit expectations; the implied ones must be changed as well.
Intel’s three Information Overload-fighting pilots represented a philosophical shift from the earlier programs, which had all been premised on training knowledge workers to use their tools differently every time they used them - in essence, full scale behavior modification. In the past, programs had been effective for one to two years; Quiet Time appears to have been at least moderately effective during the time when it was run. However, the long term effect is not yet clear. No E-mail Day and the E-mail Service Level Agreement pilot programs failed to gain traction and never became effective; this is a fundamentally different kind of failure than those of the early programs that had initial success and then faded over time.

The early programs proved to be ineffective at bringing about any lasting change. The new round of pilot programs were targeted attempts to create specific time slots where behavior was modified in a more substantial manner, both to provide benefits during the time slots and to raise general awareness of the impact that interruptions and excessive and unnecessary e-mail use can have.

It is far too early to tell if this round of Intel pilots has had lasting impact, although the extension of the Quiet Time pilot is encouraging. The lessons learnt thus far, particularly the need to tailor programs to groups in ways that reduce friction in adoption to increase participation, are helpful.

As noted in the written comments regarding the pilots, there was strong resistance to mandated rules regarding the use of communication tools. This ranged from the feeling that such rules were unnecessary to the belief that they were fundamentally flawed and would not result in lasting change.

As one participant in the pilot wrote in the post-pilot survey, “[D]on’t legislate communication, teach proper usage of different mediums of communication.” Although some legislation may be necessary to enforce proper usage of communication tools, proper usage of tools is ultimately the path that will reduce Information Overload while allowing flexibility based on conditions such as deadlines and work styles.
PERCEPTIONS

Depending on one's perspective, incoming e-mail can be either an annoyance, such as a message that could have been easily conveyed verbally by walking across the hall, or a force multiplier, such as the use of e-mail to stay involved in multiple tasks at once.

Most knowledge workers significantly underestimate the impact of distractions and interruptions on their work. This occurs for two reasons: first, the phenomenon of recovery time is not well understood and recognized, and second, interruptions are so prevalent that the knowledge worker assumes that they are normal and unavoidable.

In pre-pilot surveys at Intel, 46% of respondents said that e-mail was somewhat of a problem for them, and 14% said that it was a big problem. Yet, despite this, when asked in the same survey what techniques they used when they did not want to be disturbed, only 11% either shut down or used their e-mail client in offline mode.

This is a huge discrepancy, and is indicative of an awareness of the disruptive nature that e-mail can have, coupled with an acceptance of it as a necessary evil.

The opposite appears to be the case with instant messenger use. At Intel, 31% took action to limit IM, either by shutting it down or setting it on offline mode, which is consistent with the number that felt it to be at least somewhat of a problem, 36%.

EXPECTATIONS

In 1973 the launch of Federal Express started a movement that increased the expectation of instant gratification by delivering packages that “absolutely, positively” had to be there overnight (before then, if you wanted something delivered overnight, you had to bring it to its destination yourself). Today, the need for instant gratification is reflected in the attitude of knowledge workers who expect a reply to an e-mail within minutes of hitting the send button.
This behavior is compounded by an entire generation of knowledge workers who believe that everything they are doing is both urgent and important at the same time, perhaps a reflection from an era where Mr. Rogers told them that they were “special.”

This leads otherwise reasonable people to interrupt their colleagues because what the other person is doing couldn’t possibly be as urgent and important, a behavior exemplified in the actions of knowledge workers who send an e-mail and two minutes later telephone or instant message as if the house were on fire.

A principal reason for the low number of people at Intel who shut down their e-mail client is the expectation of rapid response times by colleagues, and an e-mail-centric work style that seldom finds workers at their desks.

In pre-pilot surveys at Intel, 67% of respondents said they read e-mail as soon as they received notification. Only 1% read their email at designated e-mail times, and this entire group was comprised of managers. When knowledge workers respond in real-time to e-mail, it negates one of e-mail’s principal advantages - its asynchronous nature, which allows users to access their inboxes when they find the time to do so.

Behind these numbers is an expectation of fast response times: before the pilot 39% of respondents at Intel felt that they were expected to answer an e-mail as-soon-as-possible, i.e. immediately upon receipt.

“As soon as possible” is an extremely fast e-mail response time, and Intel tried to address it with its e-mail SLA, although ultimately that initiative was ill-suited for the groups that used it. The E-mail SLA specified a 24-hour response time for e-mail, but after the program ended, the number of people who felt they were expected to reply as soon as possible was virtually unchanged, at 37%. There was, however, some change in the number of respondents who read e-mail as soon as they received notification, with a drop to 58% (from 67%), and those who read e-mail at designated e-mail times rose to 6% (from 1%).
RECOMMENDATIONS

Most if not all knowledge workers are, on some level, aware of the distractions, interruptions, e-mail overload, and general Information Overload that adversely impact their efficiency and effectiveness. What they do to counteract the problem is generally neither consistent nor well thought out, in part because few comprehend the extent to which these problems are impacting them. Indeed, based on a 2008 Basex survey, 75% of managers have little or no idea of how much Information Overload-related problems cost their organizations.

When Basex surveyed knowledge workers in 2008, 70% of respondents said they did not use distraction blockers. Only 10% implemented such tools themselves, and around twice as many, 22%, had such tools put into place by their organizations. While the distraction blockers referred to in the survey were tool-based (such as Web filters or temptation blockers to keep from getting distracted while working online), the results illustrate two things: first, the awareness of the need to block distractions is low, and second, tools are more likely to be put in place by company mandate than individual initiative.

In preparation for the Quiet Time pilot, Intel surveyed the pilot group regarding use of do-not-disturb techniques, which although not the same as distraction blocking tools, are thematically related and are indicative of the level of awareness that knowledge workers have about the problem.

In the Intel pilot group, the majority of engineers, 70%, did not use any do-not-disturb techniques in the course of their work routine, a number similar to Basex’ findings on the use of distraction blockers. However, 65% of managers at Intel do use do-not-disturb techniques, showing a much higher awareness of the need for undisturbed time. Since 28% of a knowledge worker’s day is spent dealing with unnecessary interruptions and recovery time (according to studies conducted by Basex in 2004 and again in 2006), this is a problem that must be addressed.
Out of those Intel employees who took action to limit distractions, IM was at the top of the list, despite the fact that neither managers nor engineers said that they saw it as a major cause of distraction. A majority of managers and engineers did, however, see e-mail as a significant distraction, yet only 11% took any action to counter its effects. This indicates a presumed reliance on e-mail and a tacit acceptance of its distractive nature. In addition, only 8% switched their IM status to do-not-disturb, showing either a lack of understanding of the feature and the significance of interruptions, or that other users ignore status messages and interrupt people through IM anyway.

With e-mail, its perceived disruptive nature was out of sync with reality. This is reflected in the actions taken; e-mail was seen as disruptive, but employees were reluctant to limit it.

Obviously, if e-mail is a critical part of the way in which a team works, which it is in Intel’s case due to the time many employees spend away from their desks, then it cannot simply be phased out. What can be done is to reexamine the way that the team is operating and explore other methods of communication that could conceivably remove some of the pressure from the inbox. On a personal level, knowledge workers can discipline themselves to check e-mail at set times, and follow simple rules to reduce overall e-mailing, such as not using the reply-to-all function and using
other tools when appropriate (i.e. posting information on a blog or wiki where it can be retrieved when convenient).

Additionally, knowledge workers must clearly communicate to others their availability and respect that of others. This is somewhat of an all-or-nothing dilemma; if a worker does not feel that their declaration of do-not-disturb will be respected, they are less likely to use these methods or to take others’ attempts seriously.

In the post-pilot survey at Intel, respondents noted that effectiveness was often rendered moot because not everyone followed the rules of the program. One noted that, “I routinely had meetings scheduled [by others] during Quiet Time. In fact I think it was worse because there was an expectation that I would be available then.” A similar sentiment was echoed by a respondent who said “What happened was that some people knew this time was available and would schedule appointments and say 'Sorry,' but schedule it anyway.”

**STEPS AN ORGANIZATION CAN TAKE**

**Top Down Implementation**

As evidenced by the discrepancy between managers’ and engineers’ viewpoints, especially in the way that the SLA was perceived, it is imperative for managers who are participants in efforts to reduce Information Overload to lead by example and adjust their expectations so they align with the new rules. Additionally, those lower on the totem pole, in this case the engineers, have to trust that there will be no negative ramifications for adhering to those rules.

During the pilots at Intel, specifically in the case of the e-mail SLA, it is clear that managers did not effectively communicate that expectations for the replies protocol had changed. Whatever steps they did take to make workers feel comfortable with a 24-hour SLA were not sufficient and surveys conducted once the new SLA was in place revealed that engineers did not feel that managers themselves respected the SLA.
It is clear from the data that engineers still felt pressured to return e-mail quicker than the 24-hour turnaround that was agreed upon. It is important to keep in mind that, after the pilot, only 4% of engineers (compared to 33% of managers) correctly identified 24 hours as the expressed or implied e-mail SLA. If workers are not confident that they can take 24 hours to respond to an e-mail without repercussions, they will not adhere to that e-mail SLA.

As noted by this respondent, “If programs like this are going to work, management needs to support them for more than just the day they are announced at a meeting.”

The use of do-not-disturb techniques must also be driven top-down. At Intel, 65% of managers use such techniques while only 30% of workers did. If management is successfully using techniques to block distractions and secure uninterrupted time to work, they need to not only share those methods but actively encourage their use.

Role and team targeted programs

Organizations can effectively reduce Information Overload through real, non-stopgap change that is targeted specifically at the group in question. Any attempt to reduce e-mail and Information Overload and provide more quiet time for workers needs to be tailored to role and group characteristics. Managers and workers, as well as entities such as teams, all have markedly different tasks and work patterns and any programs that are implemented need to take these into consideration.

For example, managers who are spending the majority of their time in meetings and depend heavily on e-mail are unlikely to benefit from, or even adhere to, any restrictions on e-mail use. Additionally, in the case of the Intel pilots, both the E-mail Service Level Agreement and No E-mail Day failed to produce the desired results in large part due to the characteristics of the teams. In the case of both pilots, many members of the teams involved were seldom in their cubicles, resulting in significant difficulty communicating when e-mail use was limited; additionally, the overall e-mail-centric culture was hard to overcome.
Even in the Quiet Time pilot, the most successful of the programs, many engineers in particular felt that changes should be implemented before extending the pilot to other parts of Intel. Many of the suggested changes revolved around the program being unrealistic due to the nature of the job (crunch times before deadlines, the need to work on a flexible schedule).

What this demonstrates is that the first step in implementing this sort of initiative is a thorough evaluation of how a team works, and what the critical communication paths are. Only then can a plan to relieve the burden of Information Overload while allowing the team to function with minimal disruption to its normal operating procedure be adopted. Such a plan would reduce friction in the acceptance of changes, increasing the chances of success.

**Train v. Mandate**

The most recent programs at Intel were mandates, in that they were based on changing the rules by which people worked. With both No E-mail Day and Quiet Time, the rules only changed for a set time slot and there was no carryover into the rest of the work week.

Earlier programs Intel ran were aimed at modifying behavior to reinforce proper and effective use of tools through training. Although those early programs did not prove effective in producing lasting change, as the lessons learnt became diluted over time, teaching the skills and proper etiquette for communications tools should not be abandoned in favor of rigid mandates.

Both approaches have merit and neither should be disparaged. Instead, they should be seen as mutually reinforcing one another. No E-mail Day, Quiet Time, and the E-mail Service Level Agreement may yet result in positive changes at Intel in regards to Information Overload, but the underlying problems remain the misuse of e-mail (both in terms of excessive quantity and poor quality), the propensity to interrupt others before considering the negative effects that will ensue, and a lack of awareness of both the debilitating effects of Information Overload and
the ability that the knowledge worker possesses to take action in order to reduce it.

Mandated programs can be effective, as seen in the extension of the Quiet Time pilot, but the root causes must be addressed concurrently through education.
TEN STEPS TO HELP MANAGE INFORMATION OVERLOAD

E-MAIL

1.) I will not e-mail someone and then two seconds later follow up with an IM or phone call.
2.) I will refrain from combining multiple themes and requests in a single e-mail.
3.) I will make sure that the subject of my e-mail clearly reflects both the topic and urgency of the missive.
4.) I will read my own e-mail before sending to make sure it is comprehensible to others.
5.) I will not overburden colleagues with unnecessary e-mail, especially one word replies such as “Thanks!” or “Great!” and will use “reply to all” only when absolutely necessary.

INSTANT MESSAGING AND PRESENCE AWARENESS

6.) I will not get impatient when there’s no immediate response to my message.
7.) I will keep my presence awareness state up-to-date and visible to others so they know whether I’m busy or away.

ALL FORMS OF COMMUNICATION

8.) I will recognize that the intended recipients of my communications are not mind-readers and will supply details in my messages accordingly.
9.) I will recognize that typed words can be misleading in terms of both tone and intent.
10.) I will do whatever I can to facilitate the transfer and sharing of knowledge.
Jonathan B. Spira, CEO and Chief Analyst, founded Basex in 1983. The author of Managing the Knowledge Workforce: Understanding the Information Revolution That’s Changing the Business World (Mercury Business Press, September 2005), he is recognized as one of the technology industry’s leading thinkers and pundits, having pioneered the study of Collaborative Business Environments, the intersection of content, knowledge and collaboration within the enterprise and beyond. He is an authority on the productivity of knowledge workers and how information technology affects them, and helped create the Knowledge Worker Impact Quotient (KWIQ) to answer the needs of IT buyers for a better understanding of the impact tools and technologies have on both the workplace and on the people who use them. Mr. Spira, who directs all Basex research and analytic activities, is a widely published author and acclaimed speaker who makes frequent appearances speaking on the future of technology and has authored hundreds of papers on business and technology issues. He is the co-author of The History of Photography (Aperture, November 2001), which was named a best book of the year by the New York Times, and a graduate of the University of Pennsylvania. He conducted graduate-level research at the Ludwig-Maximilians Universität (Munich).

Cody Burke is a senior analyst at Basex. He conducts research and has co-authored reports on knowledge worker productivity, educational technologies, and information overload. He has done independent research on a variety of topics including open source intelligence, international affairs, and security issues. Mr. Burke received a M.A. in International Relations from Bond University in Australia.
ABOUT BASEX

Basex is a knowledge economy research firm that serves IT vendors and buyers with an expertise in knowledge worker management and productivity.

A trusted advisor to some of the world’s best-known companies, Basex provides holistic research and analysis across 22 market categories on leveraging Collaborative Business Environments, the workplace that supports new, organic ways for companies to conduct business.

With more than 24 years of trusted analysis and a range of time-tested offerings, Basex works to accomplish two simple, yet elusive goals: leverage knowledge assets and make the right IT decisions.