The Cost of Not Paying Attention: How Interruptions Impact Knowledge Worker Productivity

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Contents

Executive Summary 2
Introduction 4
Types Of Interruptions 6
Interruptions and Attention Management 8
The Impact of Interruptions on the Enterprise 10
Work-life Balance 12
How Do You Manage In Spite Of Interruptions? 14
Temptation Blocker 15
Presence Awareness 17
A new challenge awaits companies in the knowledge economy: the tools which serve as a lubricant and keep knowledge flowing, such as e-mail, the Web, and instant messaging, interrupt knowledge work as well and cause significant downtime.

The cost: $588 billion per annum in the United States alone.

In looking at interruptions, it is important to determine whether something is important, urgent, or both. Many knowledge workers simply do not differentiate, or see everything as both important and urgent. Importance can also vary, based on the needs of the group or organization.

TYPES OF INTERRUPTIONS

Interruptive events can be divided into several categories.

- Total interruptions.
- Dominant interruptions.
- Distractions.
- Background activities.

In addition to the above, interruptions may be divided into passive and active interruptions.

Active interruptions are initiated by the very person who chooses to be interrupted by them. Passive interruptions come from others, and arrive via e-mail, the phone, the Web, a pager, a mobile phone, and instant messaging, just to name a few.

Modern technology has increased the variety of ways and the ease by which a knowledge worker can interrupt, or be interrupted.

Compounding this, the manner in which people work has changed dramatically, and all indications are that more change is in the air. For example, e-mail has become a staple of communication both internally as well as externally. But compared to five or ten years ago, how many e-mail messages does one receive today?
An additional issue occasioned by the knowledge economy is that the line between work and one’s personal life tends to blur. The trend began slowly, as knowledge workers were enabled to check voicemail and, later on, e-mail, from home and on the road. Today, many people feel that they are at work 24x7.

On the other side of the equation, as mentioned throughout this report, it is typical for workers to read their personal e-mail, make personal phone calls, and even surf the Web recreationally from their offices. The job will fall to companies to ensure that the lines between work and home do not become too blurred.

Work must go on, despite interruptions. Using the right tool, instant messaging v. e-mail v. the telephone, will minimize the impact of interruptions in many cases.

Still, knowledge workers can be their own worst enemy. The majority of knowledge workers tend to open a new e-mail immediately upon notification.
Introduction

Interruptions now consume 28% of the knowledge worker’s day, based on surveys and interviews conducted by Basex over the past 18 months encompassing high-level knowledge workers, senior executives at end-user organizations, and executives at companies that produce Collaborative Business Knowledge tools. This translates into 28 billion lost man-hours per annum to companies in the United States alone. Assuming an average salary of $21/hour for a knowledge worker, the cost to business is $588 billion. It would therefore be an understatement to say that attention management – the area of management science dealing with interruptions – merits immediate attention.

Considering its impact on the enterprise, it is surprising that managers aren’t more concerned. Every day in the workplace, knowledge workers divert their attention to interruptions and other distractions, thereby diminishing efficiency and productivity.

Getting work done, it seems, requires finding a place without landline phones, mobile phone reception, and Wi-Fi. In the past, a seat in an aircraft would do, but that too is changing.

In other words, whether sitting at a desk in the office, in a conference room, in one’s home office, or at a client’s, the likelihood of being able to complete a task (what many call “work”) without interruption is near nil. Not all work is created equal, nor are all interruptions. With apologies to George Orwell, some interruptions are more equal than others.

But just what constitutes an interruption? An interruption for the interruptee is not necessarily an interruption for the interrupter! Most knowledge workers don’t think of an interruption they occasion as a “bad” interruption; on the other hand, when they themselves are interrupted, their perception is quite different.

IMPORTANT V. THE UNIMPORTANT

In looking at an interruption, it is important to determine whether something is important, urgent, or both. Many knowledge workers simply do not differentiate, or see everything as both important and urgent. Something that is important may not require an immediate interruption,
whereas something that is urgent would certainly be more likely to merit an interruption.

Further, there are relative degrees of importance, to wit:

- Personal importance: how important is this issue to me?
- Group importance: if other people are to be involved in the process, how important is the issue to them.
- Organizational importance: how important is the issue to the problems that the organization is dealing with in general.

Knowledge workers need to take the issue of importance in context when they are about to interrupt someone.

Detrimental interruptions are those events that are urgent but not important; that is, when they occur, they do so on a time-sensitive basis and they largely occupy one’s attention, but they are not necessary to the work being done by the worker being interrupted. Distractions are less urgent and therefore may not occupy the full capacity of one’s attention; however, while they last they prevent work from proceeding at the usual pace. It is fair to say that one is never fully attentive to a single task; with many interruptions following in rapid succession in today’s workplace, paying 100% attention to a single task would be a Herculean effort.

It is also necessary to note that some interruptions are, in fact, truly important. Time spent helping a co-worker who needs an answer to a business-related question should not be counted as an unnecessary interruption, as it is ultimately necessary to the well being of the company. Of course, one cannot spend the entire day on such tasks, as one’s own work will go undone.

Knowledge workers need to be able to distinguish important from unimportant interruptions, and to learn how to reduce the number of unimportant interruptions they themselves cause and accept from others. This may only occur once knowledge workers recognize the cost occasioned by an interruption.
Interruptive events can be divided into several categories.

- **Total interruptions**, which completely occupy one's conscious mind and disallow any thought relevant to the original task. Example: Participating in an active phone conversation, or playing a thought-intensive game.

- **Dominant interruptions**, which largely occupy the mind, leaving thought about the original task to slowly develop in the back of one's mind. Example: Recreational web browsing, or walking around outside of the office.

- **Distractions**, which do not stop one from consciously working on the original task but do draw attention away from it so that it proceeds more slowly or less accurately. Example: instant messaging with friends or a coworker while working.

- **Background activities**, which may not be as obvious but may divert some portion of one's attention away from the original task, slightly reducing speed and/or accuracy. Example: listening to music, or worrying about upcoming events.

In addition to the above, interruptions may be divided into passive and active interruptions. A passive interruption is triggered by one of these technological communication tools or by another worker who vies for the attention of the interruptee. There also exist active interruptions, which are initiated by the very person who chooses to be interrupted by them. The latter are solely the fault of the person who is overcome by the temptation that these interruptions hold. Of course, it may be necessary to occasionally interrupt intense knowledge work and clear one's thoughts in the course of the day; this is an entirely different issue than the individual who cannot focus on the task at hand and constantly interrupts his work to visit Web sites, discussion forums, and read e-mail.

Perhaps the true root of the problem, however, is that reception of interruptions is in human nature. Of the three types of interruptions listed above, perhaps most difficult to combat is that which entertains the
interruptee. Thanks to the Internet, it is taken rather for granted now that a knowledge worker should have access to cartoons, games, and an enormous variety of trivial information at any time. As long as workers continue to make themselves vulnerable to interruptions, the problem will persist. This is evidenced by the responses to a recent Basex online survey on interruptions that indicate when respondents considered interruptions acceptable.

<table>
<thead>
<tr>
<th>Type of interruption</th>
<th>Percent of respondents considering it acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your superior needs something urgent that must be done immediately</td>
<td>94.5%</td>
</tr>
<tr>
<td>A colleague (same level) has a question</td>
<td>87.2%</td>
</tr>
<tr>
<td>A subordinate has a question</td>
<td>90.8%</td>
</tr>
<tr>
<td>A friend (for non-business reasons) has a question</td>
<td>62.4%</td>
</tr>
</tbody>
</table>

Table 1. Acceptable interruptions survey results.

Perhaps the last figure is the most surprising – and the most telling. The majority of respondents to this survey, which included knowledge workers and senior executives, didn't have a problem with a non-business-related interruption. As long as this is the case, the problem of interruptions will continue to plague business. Technological solutions can be helpful in reducing the impact of interruptions, but only if workers feel the incentive to use them to do so. Therefore, the most important step towards curbing this situation is to make knowledge workers aware of the effects of their interruptions. Only when they begin to see the interruptions as a problem can they choose to fight them.
Interruptions and Attention Management

Modern technology has increased the variety of ways and the ease by which a knowledge worker can interrupt, or be interrupted. A typical knowledge worker now has an instant messaging client, an e-mail client, a mobile phone, a desk phone, stock quotes, news feeds, and a Web browser – all competing for his attention. These electronic interrupters ensure that a worker is inundated with a constant stream of information as well as a barrage of less useful attention-grabbers.

Of course, the possibility that a co-worker can simply walk into an office or cubicle, occasioning an interruption (important or otherwise), has existed since the modern company came into existence. But a mere 20 years ago, interruptions were far less of a problem because there were fewer ways of interrupting and these methods could be more directly addressed. One could close the door, not answer the phone, and that would be it. Today, the situation is far worse, insofar as the knowledge worker who wants to remain unmolested is concerned. After all, one consistent aim of technology has been to put as much information and communication at the hands of as many people as possible, as quickly as possible. Technology has, to this end, succeeded beyond our wildest dreams. While, in theory, this should be an excellent way of increasing innovation, in practice it is dangerous as it provides far more information and activity than the human brain can comfortably process.

Over the past decade, the manner in which people work has changed dramatically, and all indications are that more change is in the air. E-mail has become a staple of communication both internally as well as externally, whereas 20 years ago it was virtually non-existent in enterprise settings. Further compounding the situation is the fact that, by 2006, over 40% of the knowledge worker population will work from non-traditional or “non-Dilbertian” environments, ranging from home offices to hotel rooms and customer sites, and that population will grow steadily over the next decade at a rate of ca. 10% per year. Escaping the direct supervision inherent in a more traditional work environment seems bound to enable greater interruptions having greater effects on work; after all, one is less likely to devote a lot of time to irrelevant tasks when one’s boss is nearby.
Indeed, telework environments, where the knowledge worker telecommutes from home, may serve only to exacerbate the problem. After all, if the knowledge worker has the comfort of watching television or lounging about the house so readily available, can he really be expected to prefer to do work instead? Many knowledge workers who work at home report that they are able to get considerably more done, and that they anecdotally face fewer interruptions. In fact, anecdotal evidence suggests that people who telecommute regularly know how to manage their time – and distractions – better and, while this is beyond the scope of our research, it is certainly worthy of consideration.

Just as the Internet has brought about a bevy of new methods of interruption, it seems natural to expect that a revolutionary technology of the future will one day facilitate them even further. By shifting to a more collaborative work environment, the knowledge industry has opened a veritable Pandora’s box, full of countless interruptions, distractions, and other evils. Whereas ten years ago, work was a more solitary pursuit, now workers are dependent on communication with each other. One result is an increase in the sheer quantity of interruptions they face.

Interruptions have approximately doubled in the past decade, and who’s to say they won’t double again within the next ten years if nothing is done to combat them?
The Impact of Interruptions on the Enterprise

In quantifying the effects of total and dominant interruptions, it can be assumed that work does not proceed while these interruptions are in effect and that the time is therefore wasted (or spent towards a different activity). Calculating the effects of partial distractions and background activities is less precise, as a knowledge worker will likely continue to proceed with the original task during these with no obvious indication that one is distracted.

Over the past 18 months, Basex interviewed hundreds of knowledge workers and conducted online surveys in order to understand how interruptions impact knowledge work firsthand. The results of this research were staggering: 2.1 hours of productivity are lost per knowledge worker per day to unimportant interruptions and distractions and recovery time from interruptions (important or otherwise). (Note that recovery time is necessary for this calculation because a worker who has been interrupted from his task will not be able to immediately resume at the pace at which he left off, even if the interruption was important. The figure was calculated by multiplying the average recovery time for all interruptions by the total interruptions and adding the total time lost to unimportant interruptions.) This amounts to a waste of ca. 28% of the typical worker’s day.

Consider, for example, the cost of interruptions to a mythical professional services firm with 10,000 employees. As illustrated in the table (Table 1, below), this company experiences a loss of nearly $400 million per annum from unnecessary interruptions. In other words, close to a third of the cost of a knowledge worker’s salary and benefits is consumed by these unnecessary interruptions.

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>Hours wasted per employee per year</th>
<th>Hours wasted per year</th>
<th>Hourly cost per employee (Average)</th>
<th>Total loss (Millions)</th>
<th>Total salary (Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive</td>
<td>250</td>
<td>503.52</td>
<td>125,880</td>
<td>$150</td>
<td>$18.9</td>
</tr>
<tr>
<td>Manager</td>
<td>1,000</td>
<td>503.52</td>
<td>503,520</td>
<td>$105</td>
<td>$52.9</td>
</tr>
<tr>
<td>Professional Staff</td>
<td>6,850</td>
<td>503.52</td>
<td>3,449,112</td>
<td>$85</td>
<td>$293.2</td>
</tr>
<tr>
<td>Support Staff</td>
<td>1,900</td>
<td>503.52</td>
<td>956,688</td>
<td>$36</td>
<td>$34.4</td>
</tr>
<tr>
<td>Total</td>
<td>10,000</td>
<td>2014.08</td>
<td>5,035,200</td>
<td>$79</td>
<td>$399.4</td>
</tr>
</tbody>
</table>

Table 2. The impact of interruptions on the enterprise
Today, according to the United States Department of Labor, Bureau of Labor Statistics, June 2005, there are 56 million knowledge workers in the United States. Extrapolating the 2.1 hours per day across all these workers yields 28 billion hours per year. Considering the average salary is nearly $21 per hour, Basex estimates that $588 billion is lost annually to unnecessary interruptions.

Given the trend over the past two decades, we can project that the impact of interruptions will increase at a rate of 5% per year. As shown in Table 2, proceeding at this rate, by 2010, 2.7 hours are lost per day, at an annual cost of $751 billion (in 2005 dollars). If the problem of interruptions is left unchecked, it will occupy the entirety of the workday by 2031.

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total loss (Millions)</strong></td>
<td>$588</td>
<td>$618</td>
<td>$648</td>
<td>$681</td>
<td>$715</td>
<td>$751</td>
</tr>
<tr>
<td><strong>Hours/day</strong></td>
<td>2.10</td>
<td>2.20</td>
<td>2.31</td>
<td>2.43</td>
<td>2.55</td>
<td>2.68</td>
</tr>
</tbody>
</table>

Table 3. The rising cost of not paying attention.
In the knowledge economy, the difference between work and one’s personal life tends to blur. As recently as ten years ago, with minor exceptions, there were tightly defined boundaries between one’s work and one’s personal time. Indeed, much of what is considered “work” could simply not be done at home. That is not to say that executives didn’t bring home files in their briefcases, and accountants didn’t work late during tax season, but by and large, there were tightly defined boundaries. Work was work and when one left the work environment, one left one’s work behind.

Today, however, it has become common practice for knowledge workers to continue to not only be available after they leave work, but to continue to do their work – from home! The trend began slowly, as knowledge workers began to be able to check voicemail and, later on, e-mail, from home and on the road. Given the ubiquity of high-speed Internet access (how many knowledge workers go without?) as well as greater mobile Internet access, the work environment can be replicated completely in the home office.

In addition to working late, knowledge workers may often check e-mail and voicemail when on holiday, responding as needed. Hearing the tasteless ring of a mobile phone in a restaurant or even watching an executive pull out his BlackBerry (referred to as CrackBerrys in some circles for their habituative nature) on a ski slope exemplifies the problem.

On the other side of the equation, as discussed throughout this report, it is typical for workers to read their personal e-mail, make personal phone calls, and even surf the Web recreationally from their offices. After all, any room with an Internet-connected computer can instantly become a theater for any of millions of Flash cartoons, a concert hall, and a large, gregarious gathering of friends. Since technologies like the computer and the mobile phone make personal and business information available side-by-side, the line between when each is appropriate is blurred in the minds of many knowledge workers.
Growing portions of these workers are members of the extraordinarily tech-savvy “NetGen” (or Internet Generation). A seemingly innate level of skill regarding the use of technology characterizes this generation. NetGeners, who are especially inclined to carry gadgets with them wherever they go, might point to the time spent working outside the office as compensation for the interruptions they suffer while they should normally be working. Unfortunately, this is not a fair trade-off. Research recently conducted by Glenn Wilson at the Institute of Psychiatry, University of London, demonstrated that workers’ effective IQ’s decrease by ca. ten points if they are distracted by other tasks. Thus, the fact that a worker might still be spending as much total time on work as he should be may not be sufficient. The value of the time is diminished when it falls sporadically between other tasks. Furthermore, workers trying to compensate by spending extra time working outside the office are probably not taking into account recovery time.

As more and more people enter the knowledge economy, it will become increasingly important to teach them how to manage the issue of work-life balance. At the same time, it is incumbent on corporate managers to ensure that these lines do not become too blurred.
How do you manage in spite of interruptions?

Since attention management should clearly be a concern for companies, some solutions are clearly needed to reduce the magnitude of this loss. While some interruptions are unavoidable (due to necessity of availability, or human nature to be unable to consistently focus on a single task for too long) certainly their effect should be reducible. All interruptions benefit at least somebody; those that do not benefit the corporation are the ones that are most problematic.

An interruption can:

• Benefit the interrupter by providing information or peace of mind.
• Benefit the interruptee by providing entertainment.
• Benefit the interruptee and the corporation by providing focus on more important work.

Some interruptions are necessary for business or personal reasons, whereas others could probably be put off for a more convenient time. Making knowledge workers conscious of this distinction and of the cost of unnecessary interruptions is an important first step towards the reduction of such waste.

To further combat this situation, it is useful to examine the causes of such disruptions in workflow. Some common ones include:

• Personal phone calls.
• Instant messaging with friends or family.
• Speaking to co-workers about non-work-related topics.
• Games and other recreational uses of computers and the internet.
• Checking e-mail.

Note that four of these five require technology, and three of them have only existed as common interruptions in the past decade. Certainly there is some value to pointing a finger at this trend; technological solutions may lend some assistance. For instance, knowledge workers can set up their e-mail clients to notify of e-mail arrival in a less obtrusive manner; instant messaging clients have features to identify the user as being unavailable.
It is also important to make sure these technological tools are used appropriately. Many knowledge workers still think of the telephone first and foremost when it comes to real-time communications. The uninitiated might ask, “Why couldn’t you just pick up the phone instead of using IM?” In actuality, the phone may be more disruptive in many instances. There are a number of reasons:

1.) The telephone rings (sometimes loudly) and others may be made aware of the call. With instant messaging, one can discreetly answer someone’s enquiry (and avoid a third party overhearing).
2.) One can carry on several IM conversations simultaneously. This is not possible on the phone, movies showing Hollywood moguls with three phones in hand notwithstanding.
3.) IM is discreet. If the user is actually on a phone conversation, that person can query someone else via IM without putting the call on hold.
4.) IM is synchronous, but “less” synchronous than a telephone conversation. Pauses of more than a moment on the phone are considered rude; this is generally not the case in IM, as only much longer pauses are noticeable.
5.) Using IM, several people can “talk” (type) at the same time without being disruptive, whereas having several people talking in a telephone conference would result in a cacophony of sound.

WHICH IS BETTER WHEN?
Under which circumstances is IM “better” than old-fashioned telephony? And under which circumstances might IM be more appropriate than e-mail? Choosing the right modality for one’s needs will also help ensure that fewer interruptions occur.

IM is better than telephone when:
- There are many people participating and all need to talk/be active.
- At least one participant is in an environment where people could listen in, and privacy or confidentiality is an issue.
There are a number of many-to-many conversations taking place.

Telephone is better than IM when…
- There are many people participating passively and one person is speaking (such as when the CEO announces a merger or acquisition).
- A more personal touch is required and the nuances of voice matter (e.g., breaking bad news).

E-mail is better than IM when....
- The text needs to be memorialized (archived for future reference, although more and more companies are archiving IM sessions).
- It contains an announcement to be sent to many people.

IM is better than e-mail when....
- An issue demands an immediate response, i.e. it is both urgent and important.
- The issue is relatively trivial, such as lunch plans.

Collaborative technologies are becoming more and more integrated into how we work. As these become more pervasive within organizations, we will have more of an expectation for people to be there – wherever “there” may be.

Still, knowledge workers can be their own worst enemy. In one Basex survey, when asked how quickly one responds to (i.e. goes to read) a new e-mail notification, 55% said immediately or shortly thereafter. Only 35% said when convenient. Given that 45% of respondents receive 50 or more e-mail messages per day, we still have a lot of work to do in managing the knowledge worker’s attention for greater productivity.

SURVIVAL TECHNIQUES OF KNOWLEDGE WORKERS

As Basex interviewed more than 1,000 individuals, one thing became clear: knowledge workers will go to great lengths to avoid interruptions.
Some of the “techniques” cited bear mentioning (these are actual, unaltered quotes):

- Refuse eye contact.
- Relocate to conference room and “hide.”
- Place chair [as barrier] in cubical entrance.
- Post sign.
- Work from home two days a week.
- Work when no one else is around.
- Work offsite.
- Work from home or move to another office.
- Leave the office.

Although some of these techniques may be effective, managing interruptions and one’s attention is clearly today at a grassroots level. However, given the number of knowledge workers that are impacted by interruptions and costs of over half a trillion dollars, grassroots is simply not enough.

Managers need to understand that, as the economy morphed from industrial to knowledge-based over the past 25 years, having a knowledge worker “hiding” in a conference room in order to get work done brings with it a huge concomitant cost. Managing a knowledge worker is clearly different than managing a factory worker. And managing hundreds if not thousands of knowledge workers requires a commitment to creating a knowledge worker-friendly environment that recognizes that knowledge workers are, for all intents and purposes, the production means of this century.
ABOUT BASEX

Basex is the recognized expert in Collaborative Business Environments, the intersection of content, knowledge and collaboration within the enterprise and beyond, and the authority on the productivity of knowledge workers and how information technology affects them. Basex created 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. The company has been cited by KMWorld as one of the “100 Companies that Matter in Knowledge Management”.

Basex has a 22-year track record of accurate research and visionary analysis that drives its clients to make the right business and technology decisions for their organizations.

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