IT@Intel White Paper

Intel IT

Employee Productivity

January 2012

Improving Workplace Ergonomics through IT

Our safety program combines safety awareness activities with software solutions aimed at preventing and reducing the number and severity of CTDs in our environment.

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Executive Overview

To help contain rising healthcare costs, Intel IT launched a unified, global Intel IT Safety and Ergonomics program. The program transformed numerous overlapping and duplicate programs into a single safety program for our organization. The safety program combines safety awareness activities with software solutions aimed at preventing and reducing the number and severity of cumulative trauma disorders (CTDs) in our environment.

The program has produced a number of accomplishments, including the following:

- **Developed a single, unified safety program for Intel IT.** Our program has a dedicated IT Safety Manager and a committee with representatives from each of our groups worldwide. The program implements one or two safety initiatives within Intel IT each quarter.
- **Established a culture of safety.** Support for safety from the CIO down, plus safety awareness campaigns, trainings, and communications has prompted Intel IT employees to modify their behaviors in ways that are safer, including those that help reduce CTDs.
- **Reduced the financial impact of CTDs.** From 2009 to 2011, the number of days that Intel IT employees missed because of CTDs decreased by 78 percent. Employees are also reporting injuries earlier, helping to reduce their severity and associated costs.
- **Increased use of software that reduces CTDs.** More than 360 Intel IT employees at 10 sites worldwide use speech recognition software to reduce keyboard and mouse use, and this figure is increasing by 10 to 20 percent each month. We also deployed ergonomics risk management software to over 2,300 IT employees who volunteered to use it.

Intel has recognized our safety program for its help in reducing employee injuries and potentially lowering healthcare costs. Other business groups intend to adopt our plan, extending our IT safety program company-wide.

Contents

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BACKGROUND

Healthcare costs continue to rise and are rapidly becoming a significant expense for companies, including Intel. To combat these rising costs, Intel IT combined numerous overlapping and duplicate programs into a unified, global Intel IT Safety and Ergonomics program that promotes safety and addresses safety-related issues for our organization. When a corporate-wide Employee Health and Safety (EHS) study subsequently discovered that a high number of Intel employees were experiencing cumulative trauma disorders (CTDs), our program decided to address this issue.

CTDs are injuries caused by repeated and prolonged activities, such as keyboard and mouse use, and often occur when individuals do not follow good ergonomic practices. CTDs can be severe and can sometimes cause irreversible damage and long-term pain for employees. They also generate significant medical and indirect costs.

Data from our corporate injury database revealed that the majority (40 percent) of injuries occurred in office environments, not in factories or on construction sites. The data also showed that CTDs accounted for 95 percent of office environment injuries.

With early treatment, the severity of a CTD can be significantly reduced. Otherwise, the consequences can be serious—including constant pain and even inability to work in the environment where the injury occurred. The direct medical costs for a CTD are significant, but the indirect costs, such as those related to employee absences, insurance, or the time needed to investigate the injury, can reach eight to 10 times the medical costs.

Unfortunately, many employees were waiting six months to a year or more before reporting an injury to Intel. By this time, many minor injuries had become more serious and costly CTDs.

Part of the challenge of getting employees to report early was a lack of awareness of how serious a CTD could become. In addition, many employees did not want to take time off from work or felt the injury would resolve itself eventually. Many attributed the early pain of a CTD to an activity done outside of work; for example, working in the yard or exercising.

Employees needed more information about the cause and nature of their injuries. They also needed to know more about the resources Intel provides to treat injuries early, such as onsite health clinics, therapeutic massage, and ergonomics consultants.

Our Safety and Ergonomics program determined that we could reduce the impact of CTDs and their costs within Intel IT through a combination of safety awareness campaigns, visible support from our CIO and upper management, and the use of software designed to prevent CTDs.

SOLUTION

The first step in addressing our safety initiatives was to revamp the existing IT safety program. We established the infrastructure for the program and enlisted support for it from the CIO down to the employee level. This support was critical in helping us emphasize the culture of safety we were trying to establish. When the internal study detected the issue of CTDs, we were prepared to address it. We conducted numerous safety awareness campaigns and used ergonomic risk assessment software and speech recognition software to promote work habits that decrease the possibility of getting CTDs.

Developing the Ergonomics Program

Our new safety program replaces the numerous overlapping and duplicate safety programs we had previously. We created a dedicated IT Safety Manager role to develop and manage the program and established an IT Safety Steering Team (SST) that draws representatives from each Intel IT group, worldwide. These "safety champions" volunteer for a one-year rotation, meeting regularly to address safety issues and plan and implement one or two safety initiatives each quarter.

EMPLOYEE SAFETY SELF-ASSESSMENTS

One of our early safety initiatives involved developing and promoting online safety self-assessments (SSAs) for office ergonomics. The employee could contact an Intel ergonomics professional for assistance, if needed.

THE SAFETY MANAGEMENT BY WALKING AROUND PROGRAM

After learning that CTDs were a significant issue in the work environment, we launched an initiative to update a safety program that Intel implemented in the 1980s, called Safety Management by Walking Around (SMBWA), to capture data about the activities that were leading to CTDs. In this program, managers serve as auditors who observe and question employees performing their day-to-day tasks. They then fill out the SMBWA checklist (see Figure 1), indicating whether an employee is demonstrating safe ergonomic behaviors and has knowledge of certain safety-related topics and resources. The Safety and Ergonomics program uses the checklist to determine where best to focus its efforts and resources, and to measure the success of its safety initiatives.

As part of the program's update, we created a single online SMBWA database for all of Intel IT, revised the SMBWA checklist with items more relevant to ergonomics issues, and trained all IT managers to be SMBWA auditors. To date, 81 percent of IT managers have successfully conducted an audit.

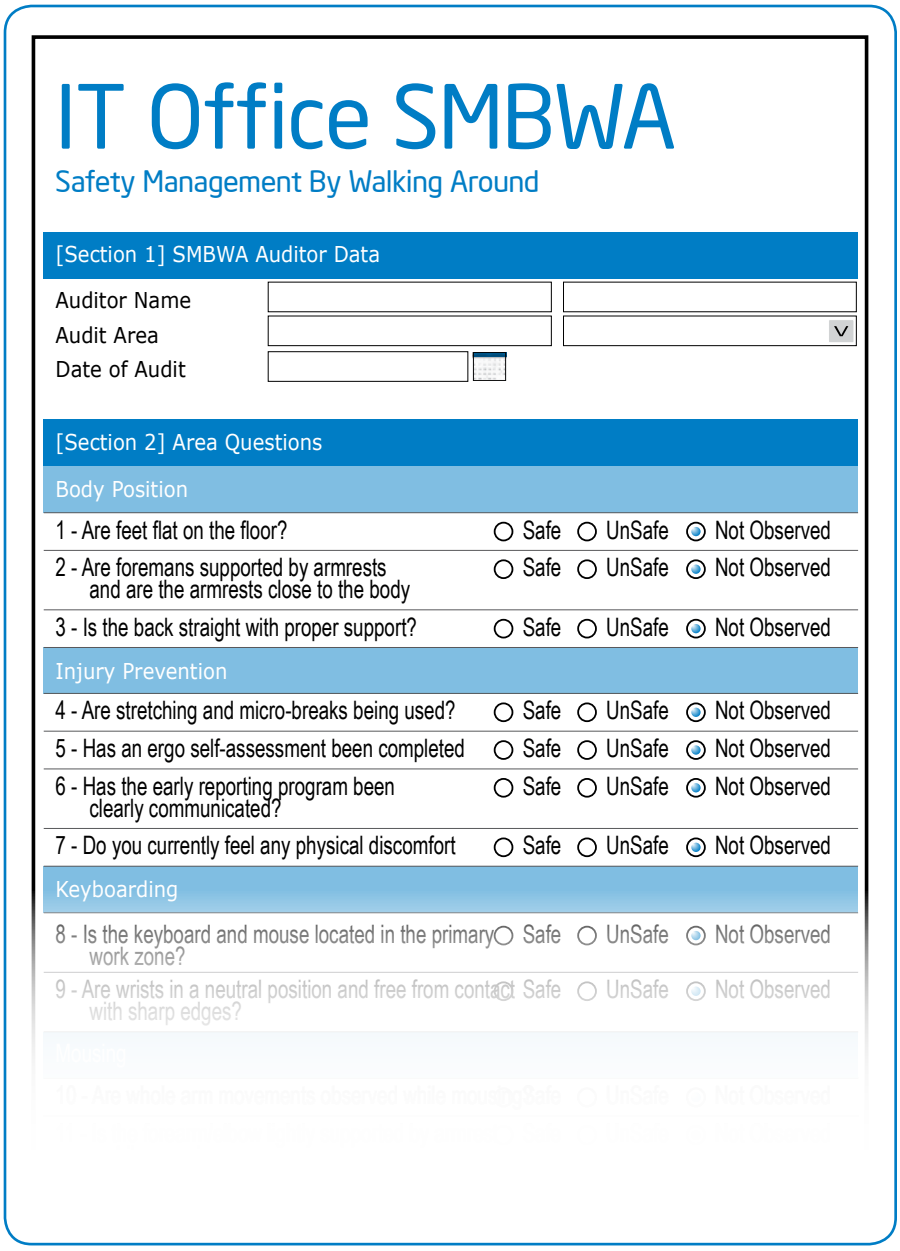

Figure 1. SMBWA checklist. Auditors use the SMBWA checklist to record employee knowledge about safety and observed safety behaviors and then enter the results in the online SMBWA database.

Leadership Support for Safety

A critical factor in our program's success was visible support for a culture of safety from the CIO and IT senior management. Our CIO understood the importance of the program and its goals and provided full support, even conducting an SMBWA audit personally.

Safety is now a regular agenda item in the monthly CIO IT staff meeting, providing a forum for the discussion of safety-related initiatives and issues at the highest level of the organization.

Senior management and the CIO attend quarterly injury review board meetings, where managers of injured employees provide details about the injuries, including the root cause, actions taken, and how employees are currently faring. The root cause analysis helps inform overall program changes to prevent similar injuries from occurring to other employees.

In addition, safety issues were given more prominence within the organization.

- Quarterly business update meetings, which all IT employees attend, also include discussions about safety initiatives.
- The IT Safety Manager and Intel EHS management work together to align the two safety programs, often working on the same initiatives.
- IT managers monitor their employees' CTDs and report these injuries to senior management.

Safety Awareness Campaigns

In the workplace, employees need to be aware of safety and ergonomic concerns at all times. They also need access to resources that can help prevent injuries or treat these injuries early on.

We are addressing these issues through a variety of safety awareness campaigns. For example, we teamed with corporate EHS to create a video aimed at encouraging early reporting of injuries. We've also published several articles in internal newsletters and employee web sites. Some of the topics we've covered in these articles include:

- Promoting the availability and benefits of speech recognition software to resolve or avoid ergonomic issues.
- Informing employees about options available onsite to help treat injuries early; many Intel sites offer consulting with ergonomics professionals and access to therapeutic massage and physical therapists through onsite health clinics.
- Providing information about safety training opportunities and management support for modifications to help prevent injuries from occurring or to keep existing ones from becoming more serious.

We plan to continue these campaigns in our ongoing efforts to improve safety awareness.

Using Technology Solutions to Reduce CTDs

Intel IT also began using ergonomic risk management software and speech recognition software to mitigate the risk of CTDs. While our goal in deploying these applications is to reduce the number of CTDs, we also needed to ensure that the additional computing demands would have no impact on employee productivity. Because we have standardized on mobile business PCs based on the 2nd generation Intel® Core™ processor family, employees' PCs have more than enough compute performance to absorb the extra overhead of these new applications.

ERGONOMIC RISK MANAGEMENT SOFTWARE

To generate the data needed to manage ergonomics issues, we deploy ergonomics risk management software to employees who choose to use it. This software tracks activity on employees' computers and uses the data in two ways:

- To inform employees of risk levels associated with keyboard use, mouse use, and general compliance with good ergonomics habits. It also provides employees with tips to reduce their risk of injuries and with pop-up messages to encourage them to stop working and stretch or do other exercises that reduce the likelihood of injury.
- To inform managers of their employees' general risk levels. The software combines data from all employees in a department. The data is kept anonymous, but it gives managers visibility into general group trends. In departmental meetings, managers often discuss with employees the issues identified by these reports, thereby promoting and reinforcing safer behaviors.

SPEECH RECOGNITION SOFTWARE

We realized that speech recognition software could be a good alternative to continual keyboard and mouse use. In addition, the release of speech recognition capabilities on certain smart phones indicated that the technology was gaining widespread use and was therefore more likely to be adopted by our employees.

- Using speech recognition requires a significant behavior change. We determined that we needed to both increase awareness of the software's capability and provide face-to-face training to achieve successful adoption in our organization.
- We conducted a pilot implementation with 50 employees to test the viability of the software. We met with safety teams across Intel to increase awareness of the software's capabilities and to determine whether it would work with non-native English speakers with accents. This capability was important because the software supports only English.
- After the pilot proved that the technology was viable, we targeted an initial rollout of the software across Intel's major geographies. This rollout established a foundational group of users at 10 sites.

- We next developed a team of trained instructors that could provide consistent face-to-face training on the software's use. We wanted to make sure that we had training resources in place to guide the success and broader adoption of the program.
- Once training resources were in place, we began raising awareness of the speech-recognition software by promoting it through our internal newsletter.
- Because our training resources were limited, we selected the employees for whom the software would make the greatest impact. Initially, we targeted rollout of the software to employees who were most impacted by CTDs, which included those with a previous or current injury or a doctor's recommendation. Next, we selected employees who were deemed at high risk for injury based on ergonomic risk assessment software, a self-assessment, a conversation with their manager, or an ergonomic evaluation. When the needs of these first two groups were met, we addressed requests by employees who were interested in using the software.

Results

Our efforts to address safety and ergonomics issues produced the following results:

- **A single, unified safety program for Intel IT.** We now have the infrastructure in place for a successful safety program and have eliminated any duplicate or overlapping safety efforts within Intel IT.
- **High-level leadership support for organizational safety.** From the CIO level down, our safety program has the support it needs to succeed. Safety topics are prioritized for inclusion in staff and departmental meetings. In addition, managers are trained to promote injury prevention by encouraging early reporting, providing an appropriate ergonomic work environment, and working with employees to reduce activities that could lead to CTDs.
- **Successful capture of safety audit data.** As managers conduct audits, they record the data in our online SMBWA database. We analyze this data to inform future safety needs and to measure the success of current initiatives. To date, all IT managers have been trained to be auditors, and 81 percent have successfully conducted an audit.
- **Promotion of a culture of safety.** Because of our ongoing safety awareness campaigns, Intel IT employees are aware of the importance of safety issues, including reporting any injuries promptly.
- **Increased use of ergonomics risk management software.** Currently, over 2,300 IT employees use the ergonomic risk management software, and we expect that number to continually increase.

  Rapid growth has occurred in the use of speech recognition software. Currently, across 10 sites, 360 Intel IT employees use speech recognition software, with new users being added at a rate of 10 to 20 percent per month. Use of the speech recognition software is dramatically reducing mouse and keyboard use. In one example (see Figure 2), ergonomic risk management software indicated that an employee (blue line) was using her keyboard and mouse noticeably more than peers in her working group (gray line) and employees at the overall site (dark gray line). After training, the employee began using speech recognition software (week 3), subsequently reducing her mouse and keyboard usage dramatically.

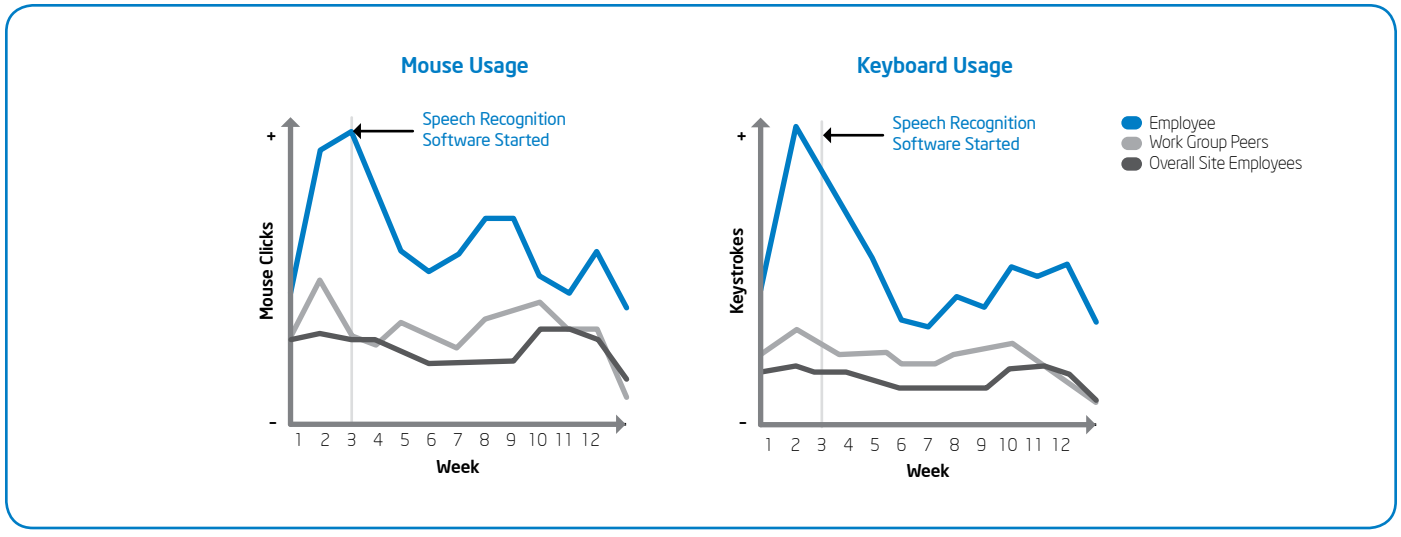

Figure 2. The use of speech recognition software reduces mouse and keyboard usage. The blue line shows a drop in mouse and keyboard use after the employee began using speech recognition software. Intel internal measurement, 2010.

Understanding the CTD Ratio

We use the cumulative trauma disorder (CTD) ratio as a measure of progress in getting employees to report injuries early. A higher CTD ratio indicates that employees are reporting injuries earlier. Our goal is to achieve a minimum of a 9:1 CTD ratio throughout all Intel IT groups.

The CTD ratio is calculated by comparing the number of first aids to recordables where:

- A **first aid** is any work-related injury or illness that is reported to onsite medical staff and is not a recordable. All non-recordable injuries or illnesses are classified as first aid, even if no medical treatment was given.
- A **recordable** is any work-related injury or illness that results in one or more of the following: death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, loss of consciousness or a significant injury or illness diagnosed by a physician or other licensed health care professional.

For example, a ratio of 7:1 means there were 7 first aids for every 1 recordable.

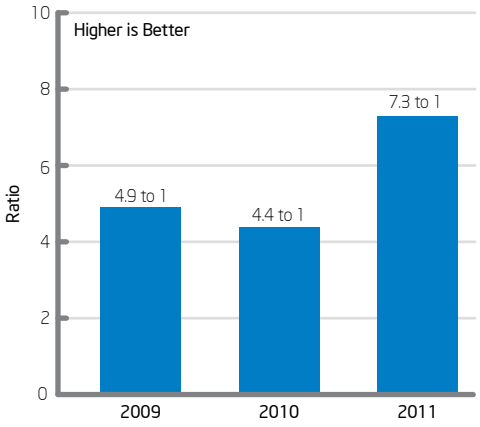

Figure 3. Cumulative Trauma Disorders (CTD) Ratio for Intel IT Overall

- **Reduced impact of CTDs.** We use the CTD ratio to measure how timely employees are in reporting injuries (see the sidebar for a description of how this is calculated). A higher CTD ratio indicates that employees are reporting injuries earlier. Our goal is to achieve a minimum of a 9:1 CTD ratio throughout all Intel IT groups.

  From 2009 to 2011, the CTD ratio organization-wide went from 4.9:1 to 7.3:1 (see Figure 3). This increase demonstrates that employees are reporting injuries earlier and are therefore reducing the severity.

While the number of injuries reported has remained fairly steady, the severity, duration, and number of impacted days have been noticeably reduced. For example, Intel internal data shows a 78 percent decrease in days away from work for Intel IT employees between 2009 and 2011. Although it is difficult to financially quantify the benefits of these reductions, we believe Intel IT and our employees are experiencing significant benefits.

Key Lessons

Through the development of our safety program and the implementation of several initiatives, we have learned several important lessons:

- Systems must be established first. We first set the systems in place for our safety program. We created a safety manager role, a safety committee, collected safety data, and drove our initiatives based on the data.
- Leadership support is critical. For our safety program to be effective and to establish a culture of safety, we needed high-level leaders to take an active, visible role in promoting safety.
- Root cause analysis informs program updates. We use the root cause analyses presented to the injury review board to help us update our program in ways that help prevent other employees from experiencing a reported injury.
- Injury reporting increases at the beginning of any program. When we first rolled out our safety program, we saw a significant increase in the number of injuries because employees were finally reporting them.
- Speech recognition software requires training. For our employees to use speech recognition software successfully, we determined that face-to-face training and frequent use of the software after the training was critical.
- Ongoing safety awareness is critical. For our employees to understand the importance of safety, we continually emphasize its importance through a variety of awareness campaigns.
- Monitoring the CTD ratio provides critical data. To measure the success of our early-reporting campaign, we set a goal to achieve a 9:1 CTD ratio throughout our organization. We were able to increase this ratio by changing employees' work areas and habits, including the use of new equipment to address ergonomic issues.
- Safety programs take time to make a notable impact. Our program has been in place for approximately four years, and we are now seeing significant progress with employees reporting injuries sooner than they did previously.

FUTURE PLANS

We will continue building our safety program and introducing new initiatives to improve workplace ergonomics and overall employee safety.

In the short-term, we intend to expand use of the speech recognition software to a level capable of demonstrating a measurable reduction in CTDs. We will also continue to use the data generated by the SMBWA and ergonomics risk management software to guide us in developing and measuring the success of future safety initiatives.

CONCLUSION

With the creation of our IT Safety and Ergonomics program, we have established an infrastructure dedicated solely to safety and ergonomics issues and have raised the visibility of safety issues across our organization and Intel. Through this program, Intel IT is helping reduce the expenses associated with CTDs and their impact on IT employees.

Key to our program's success has been support from high-level management, including the CIO. In addition, our safety awareness campaigns, feedback from ergonomic risk management software, and the use of speech recognition software are helping reduce injury severity and the impact of CTDs on our individual employees and our organization as a whole.

Although implementing an effective safety program is a long-term, multi-step process, our IT Safety and Ergonomics program has already reached several significant milestones. We believe that by reducing the severity of injuries, our safety program is not only helping our employees enjoy better health, but also helping to reduce the medical and indirect costs associated with CTDs.

ACRONYMS

CTD	cumulative trauma disorders
EHS	Employee Health and Safety
SMBWA	Safety Management by Walking Around
SSA	safety self-assessment
SST	Safety Steering Team

For more information on Intel IT best practices, visit www.intel.com/it.

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