

# The Business Case for Ergonomics/Human Factors

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**Bottom Line: Incorporating ergonomics into your business plan adds value and stimulates profitability.**

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**K**ey priorities in the most admired companies include teamwork, fair treatment of employees and innovation, according to a recent *Fortune* magazine article. These highly successful companies take pride in their ability to take swift action on new opportunities in order to translate their vision into reality.

The field of ergonomics/human factors is one of those new opportunities for enhancing a business and contributing to its overall profitability. It brings together two of business' most important assets: its people and its technology. Unfortunately, some companies limit the possibilities by thinking that ergonomics/human factors addresses only physical safety and comfort. What many of the most-admired companies have found, however, is that several aspects of the business can benefit from incorporating ergonomics/human factors into product design, operations management, human resource management and facilities management.

## Applying Ergonomics/ Human Factors

"Ergonomics" in the United States has evolved to mean the science that addresses the physical and physiological aspects of people; "human factors" generally refers to their cognitive and decision-making aspects.

In business environments, the ability of employees to *think* as well as to *act* is critical to their safety and to the profitability objectives of the organization. Any organization that wants to support its vision by developing highly efficient, safe processes; by designing highly functional, appealing products; or by building and retaining a highly skilled, motivated workforce can make a business case for integrating ergonomics/human factors principles into its operation. In every case, there will be significant economic impacts:

**Reason 1: Reducing Risk:** Reducing the risk of catastrophic events, such as loss of life and destruction of property, motivates some organizations. Often, "human error" is identified as the cause of a serious accident, but the real cause of the accident frequently is in the design of the system, in the operating procedures, in the expectations placed on the employees or in the lack of appropriate training.

Ergonomics/human factors can address the system and worker issues to prevent expensive loss of lives and facilities. The Three Mile Island incident, in which an accident at a nuclear facility was caused by faulty design and processes, and not only human error, was a wake-up call for many processing businesses. However, many manufacturing companies that use chemicals in their processes still experience

dangerous releases. The risk potential could be avoided through a Human Error Analysis study and the implementation of corrective actions.

**Reason 2: Meeting Productivity and Quality Demands:** In this highly competitive business environment, plant managers and operations managers constantly strive to reduce production costs by reducing cycle time, minimizing product changeover time, reducing scrap, reducing time spent in rework, reducing work-in-process, and other measures of efficiency.

Some organizations now link their ergonomics/human factors efforts with their overall approach to improving manufacturing processes, referred to by some as kaizen. The goals are similar: improve productivity and quality, reduce the cost of operations, and meet the expectations of customers. The process steps are virtually identical, and so, as the improvement or kaizen teams work together to identify and improve processes, they incorporate ergonomics/human factors solutions as part of the corrective actions.

**Reason 3: Controlling Costs of Injuries:** The most admired companies value their employees and place employee safety and retention among top priorities for achieving their vision. Not only do healthy employees reduce workers' compensation and related costs, but experienced employees use their skills and knowledge to enable the company to provide better products and services.

**Reason 4: Meeting the Demand for Innovation and Growth:** Cost control is not enough to enable organizations to excel and to achieve higher levels of profitability. They must create new products and move service to new heights. Developing environments that enable creative, talented employees to excel becomes critical in the design of offices and laboratories. Just as important, creating systems that include all phases of the work, from concept development through acquisition of parts and final production, can be critical in controlling costs. The development of the Comanche helicopter, using a human systems approach called MAN-PRINT, has saved the Army and its contractors millions of dollars and has inspired application of the system in other projects.

### Measuring Results

The metrics involved in tracking results vary significantly. Some organizations quantify the activities that indicate that people are actively involved, such as counting the number of solutions that have been implemented, the number of ergonomics teams and the frequency of meetings. Ultimately, however, it is the outcome measures that count: productivity measures (e.g., cycle time, cost per unit); quality measures (e.g., scrap rate, rework); injury measures (e.g., incidence rate, absenteeism); customer acceptance of product (e.g., number of units sold); and others.

In a recent Joyce Institute/Arthur D. Little survey sent to more than 200 companies, respondents indicated that they are able to document results of applying an ergonomics/human factors approach. Ninety-two percent of the respondents reported a decrease in workers' compensation costs of more than 20 percent; 72 percent reported productivity increases of greater than 20 percent; and half the respondents reported quality increases in excess of 20 percent. The measures can be grouped into three categories: the impact on the person, the impact on the job or

product, and the impact on the organization. A few case studies illustrate these impacts:

**Case Study 1:** In the receiving area of a major air conditioner manufacturer, several employees process incoming packages from small package carriers. Previously, the receiving area was several bays away from the dock. There was continuous rehandling of packages, unnecessary transfers, sorting of packages occurring at floor level, and other practices which caused back injuries and delays. As a result of an ergonomics/human factors analysis, the receiving area was moved closer to the dock, packages were sorted on conveyors, and the receiving process was streamlined, all within four months. The results were dramatic (See Fig. 3).

**Case Study 2:** In the assembly area of an electronic components manufacturer, injury rates were extremely high and productivity was affected. The company had used job rotation as a means of minimizing injury, but between 1992 and 1997, injuries tripled. It decided to work with a consultant to develop corrective actions and a system for preventing further injuries.

The system identifies risk factors and stressors for each task so tasks can be matched with the capabilities of workers who are injured or who are beginning to experience symptoms of upper limb disorders. The system is used by managers and by treating physicians at the local clinics. As a result of this approach, the company has had no lost time injuries to date in 1998.

SOURCE: Arthur D. Little. Inc.

**Case Study 3:** In an office environment where employees use keyboards most of the day and are monitored for performance, there was a high rate of upper limb disorders and concerns about productivity. The approach required that both physical (ergonomic) and cognitive (human factors) aspects of the work be addressed.

The organization developed new workstations with adjustable features to accommodate the wide range of employees and commissioned training to enhance employees' ability to perceive and respond to information on the screen quickly and accurately. It provided training in health and comfort strategies, including rest pauses during which stretching and fatigue-relieving exercises were performed. It trained workers and supervisors to adjust the workstations for maximum comfort.

As a result, incidence rates have been kept to a minimum, and operators are now achieving target productivity levels in two-and-one-half to four weeks, instead of the 12 weeks previously required. The company estimates that, in the first year, it has saved \$10 million through injury reduction and productivity improvement!

Organizations seeking to fulfill their vision needs have to be innovative in their approach to integrating people and technology in a way that is beneficial to everyone and to the organization. The survey results (See Fig. 4) indicate that, by one important measure, return on investment, there is a strong business case for ergonomics/human factors.

As the science of ergonomics/human factors matures, it will become part of the life cycles of product development and of working environments and yet another way in which successful organizations compete for business and for qualified employees.

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