Health and Stress Issues of Office Automation: A Singapore Study

Shailendra Palvia and Lai Lai Tung
Nanyang Technological University

This study1 reports the results of a survey on the impact of IT on health and stress of 87 Singapore office workers. Results indicate that more than 70% of the office workers reported eye strain and general stress in using IT. There is a positive correlation between age and health problems such as eye strain, stress and backache. There is also a positive correlation between the number of hours spent in front of a computer monitor and eye strain and stress. The top three sources of stress include long hours spent in front of the computer, having to prepare a lot of documents, and not being fully competent with IT. The top three factors crucial to doing a job well in an IT environment include having computer knowledge, having facilities for maintenance of data, and having proper lighting for screen display.

Over the last forty years, information technology has significantly changed the way an office worker performs his/her tasks. The office workers of the past used typewriters for correspondence and file cabinets for information storage, while the modern office workers use office automation (Hirschheim 1985). In Singapore, although the use of office automation is widespread, no systematic study has been conducted to explore how well the modern office workers have coped with office automation. This paper summarizes our research on the impact of this technology on the office worker’s job satisfaction, motivation, health, and stress.

Understanding the role of human factors — the scientific study of people at work — involves systematically applying knowledge of people’s sensory, physical, intellectual, and motivational attributes to the design of the environment of the office (Galitz, 1984). Ergonomics — the science of fitting the workplace to the worker — involves the design of furniture and equipment to meet the needs of workers, which is important in improving productivity (Sox 1990). These two types of research are especially significant for a country like Singapore, where labour is one of the most scarce resources. Management must be aware of the importance of an “ergonomically right” office.

When human and ergonomic factors are not taken into consideration in designing an office and its information technology equipment, it becomes difficult for the office worker to be productive and to work without health hazards or stress. Many physical, psychological, and social problems have followed the introduction of video display terminals (VDTs) in offices. Some of the common ailments arising from working in an IT environment include visual problems, postural problems, and various psychosocial problems due to work stress. The next section, the literature review section, describes in detail

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some of the common health problems that office workers experience in their workplace.

**Literature Review**

**Visual Problems**

Numerous field studies in recent years have uncovered a variety of complaints about eye troubles associated with using Video Display Terminals (VDTs). The most commonly reported visual discomforts are eye strain, burning eyes, irritated eyes, and blurred or double vision (Sox, 1990). Research by Dainoff (1982) also found that eye strain and back pain have a direct correlation with the number of hours spent working with a computer.

One study (Neal, 1989) found that people in their twenties and thirties who work at least six hours a day in front of VDTs have trouble focusing much sooner than if age caused such problems. Another large scale study (Coe et al., 1980) reported that eye fatigue was reported by 50% of the VDT operators’ group compared with only 33% among the group of non-VDT control operators. Interestingly, this study also reported that fatigue was less (42%) among those VDT operators who were able to take frequent informal breaks (finding something to do which allowed them to look away from the screen) than those who cannot (62%).

To combat these problems, Dainoff and Dainoff (1987) and Springer (1982), among other researchers, suggested several ergonomic factors that are crucial to high performance in an IT environment. Among these factors, the more prominent ones are lighting positioning and workstation design. Palvia and Palvia (1990), while evaluating the effectiveness of modes of data, procedures, and logic representations in the different phases of systems development life cycle, provided information on the ergonomic effectiveness of systems development techniques for different phases.

**Postural Problems**

Like visual discomfort, many studies have uncovered reports of postural problems associated with using VDTs (Galitz, 1984). Many people who work with computers complain of back pain. Other postural problems include shoulder pain, wrist pain, neck pain and body fatigue. Most of these complaints can be remedied with properly designed furniture that is movable and adjustable vertically and horizontally.

**Psychosocial Problems**

A third area of concern is related to a person’s psychological reactions to IT. Limited research evidence now available indicates that some users of VDTs are more prone to stress than their colleagues who do not use VDTs. (Galitz 1984, Brad 1984). Other physical conditions, such as headaches, nausea, and dizziness, may be related to stress and attitudinal problems.

Disoriented sense of time was found to be a major problem for users who have used computers for a prolonged period of time (Josefina, 1985).

Emmanuel (1983) suggested that many things affect the amount of stress workers experience. Among a host of reasons, he highlighted users’ past experiences with computers and the ages of the users as prominent attributes related to stress. Older employees in particular suffer from psychological stress stemming from fear of computers— fear about not being able to use the machines and fear of failing when competing with younger, better trained workers, or fear of being replaced by them. He also mentioned that stress is often the result of diminished contact with other office workers.

Cohen (1981) found that lack of autonomy and pressures for performance are distinguishing features of highly stressful IT jobs. Problems, such as tension, low morale, poor attitude, isolation, fear, and worry, are also symptoms of psychological stress. Fear of job loss, physical harm, and isolation from co-workers may cause operators of automated equipment to develop any of the aforementioned stress symptoms. Some common causes of work stress resulting from working in an IT environment are (Cohen, 1981; Hirschheim, 1985; Sox, 1990):

i) Lack of control. The lack of autonomy is one distinguishing feature of highly stressful jobs. The IT environments often do not permit workers to exercise control over the manner, order and pace of their work. Tasks must be performed in the prescribed way, prescribed order and at a pace dictated by the computer’s response time.

ii) Heavy workloads. Computerisation frequently brings with it calls for high production standards. A person is often asked to perform at maximum rates for long periods of time, sometimes resulting in work fatigue and even job burnout.

iii) Pressures for performance. Pressures for high performance is another distinguishing feature of stressful jobs. Constant pressures to achieve high performance, to achieve a machine-like efficiency, may be both outwardly imposed by management or inwardly imposed by the worker.

iv) Monitored performance. Computerised activities
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