

Electronic Performance Monitoring (EPM)

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Preface

In the past two decades, the advent of VDT-computer technology has resulted in major changes in the workplace. One of the more dramatic of these changes involves the use of Electronic Performance Monitoring (EPM) to manage or control the work process. The Office of Technology Assessment, US Congress (1987), has defined EPM as the use of computer technology to collect, store, analyse and report information about a worker's activities. In effect, the human supervisor is being replaced by an electronic supervisor that can track, evaluate and feed back performance on a continuous basis.

In the United States, it is estimated that EPM is used to evaluate the performance of approximately six million clerical office workers (OTA, 1987). Over the next decade, the application of EPM is expected to spread rapidly throughout the world, given the possible productivity benefits of this technology in information and service work and the resulting competitive advantage that it would provide in a global economy.

It is increasingly apparent that the challenges presented by VDT-computer technologies such as EPM go beyond the traditional micro-ergonomic concerns of illumination levels and physical workstation design. Little is known about the effects of EPM technology on work organization factors such as workload, task control, supervisory style, performance evaluation and feedback. These macro-ergonomic or socio-technical considerations must be addressed in order to provide an optimal interface between workers and EPM technology.

This special issue examines the implications of EPM technology for work-related stress, health and productivity. It reviews the research literature on EPM and offers recommendations for further investigation. It provides the applied ergonomist, job supervisor and worker with practical suggestions regarding the design, installation and administration of EPM work management systems. It aims to prevent or minimize the pitfalls of improper EPM work management practices before they become widely entrenched in the workplace.

The introductory article of the special issue provides a theoretical analysis of the stress effects of EPM. Amick and Smith's paper describes a conceptual frame-

work for understanding how monitoring technology alters the structural conditions of work so as to either enhance or diminish job demands or the worker's ability to cope with these demands. It provides the practitioner with a frame of reference for assessing the impact of EPM systems on job and organizational factors related to job stress, worker health and productivity. Amick and Smith offer ergonomics recommendations for the 'proper' design and administration of EPM systems.

Since electronic performance monitoring is a relatively new work practice, there has been little systematic research on its possible stress effects. The studies reported in the next two papers represent efforts to evaluate the effects of electronic monitoring on stress and job satisfaction in workplaces where EPM is extensively employed. Smith, Carayon, Rogers, Lim and LeGrande's paper empirically tests models of stress in EPM among directory-assistance operators, service representatives and clerks in the United States telecommunications industry. The models represent an innovative attempt to integrate job design and work stress theories in an attempt to understand the stress effects of EPM. DiTecco, Cwitco, Arsenault and André's paper reports on the findings of a questionnaire survey designed to identify work performance and telephone surveillance of conversations with customers.

To avoid the pitfalls of electronic monitoring, there is a need to formulate work design and management strategies in EPM that are based on sound ergonomics principles. There is also a need for intervention and case studies that demonstrate the efficacy of work design and management strategies in EPM. The next three papers of the special issue address these practical or applied aspects of electronic monitoring. Westin's paper provides a macro-ergonomic analysis and case study intervention of two factors that are considered essential to the successful use of electronic performance monitoring – a favourable organizational climate and fairness of the monitoring process. Shell and Allgeier's paper reports on a demonstration study that attempts to overcome the inherent propensity of EPM monitoring systems to over-emphasize quantity at the expense of quality of work output by using a multi-level incentive model that employs parameters of quality (customer and supervisor evaluations), quantity of production, sales and individual goals. Schleifer and

Shell's paper proposes an innovative stress control strategy for workers who have difficulty meeting work standards (e.g., keystrokes per minute) enforced through EPM. The strategy advocated by Schleifer and Shell involves adjusting work standards with a stress allowance so that the workload demands are in balance with the worker's performance capacities.

In the final paper of the special issue, Lund reviews the research design issues that are relevant to investigating the stress and performance effects of electronic monitoring. Lund evaluates the advantages and disadvantages of different research methodologies and offers recommendations for future work. He emphasizes the need for studies that examine the contribution of monitoring to other possible sources of stress such as work overload or lack of job control.

EPM technology has the potential to increase worker productivity. This end will not be well served, however, if EPM is used in a coercive manner to exercise greater supervisory control over the worker. The long-term productivity benefits of EPM are more

likely to be realized if the technology is used not merely to control the worker, but rather to increase the worker's sense of competence and control over the work process. This can be best accomplished through the application of ergonomics principles and practices that not only enhance productivity but also promote worker well-being. It is to that end that I would like to dedicate this special issue on electronic performance monitoring.

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References

OTA, 1987, 'The Electronic Supervisor: New Technology, New Tensions'. Office of Technology Assessment, Congress of the United States. (OTA-CIT-333) Washington, DC, Government Printing Office.