# THE OFFICE OF THE FUTURE AND KNOWLEDGE WORKER PRODUCTIVITY

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## ABSTRACT

Integrated office systems can improve the effectiveness of office workers. This paper describes research conducted at BN Software Research, Inc. in Toronto where 19 knowledge workers were given electronic work stations to help them with various aspects of their jobs, including text editing, electronic mail, information retrieval and numerous administrative functions. Some post test and system monitoring findings are presented and a methodology for "user-driven design" or customization of electronic office systems to a given office is discussed.

## RÉSUMÉ

Les systèmes de bureau intégrés peuvent accroître l'efficacité des employés de bureau. Cette communication décrit les études menées au BN Software Research, Inc. de Toronto, dans le cadre desquelles on a doté 19 employés dans le champ d'informations de postes de travail automatisés afin de les aider dans l'exécution de leurs diverses tâches: traitement de textes, courrier électronique, recherche documentaire et autres fonctions administratives. Cet exposé présente certaines constatations touchant l'évaluation consécutive aux essais et le contrôle des systèmes, ainsi qu'une méthodologie de la conception "adaptée à l'utilisateur" ou de la personnalisation des systèmes de bureau informatisés.

Intuition and early experience indicate that integrated office systems can have a dramatically positive effect on office productivity. The integration and application of computing, telecommunications and information technologies to the office environment is beginning to transform the ways in which people and organizations work. More importantly, it appears the greatest potential of these changes will not be cost savings from increased typing efficiency, but rather, the augmentation of the abilities and effectiveness of 'knowledge workers' - the managers and other professionals who work in processing, managing, retrieving and communicating information.

Until recently little has been done to measure the effect of integrated office systems on knowledge workers and organizations. In 1979, through the funding of Bell Canada, a multidisciplinary team, known as Office Information Communication Systems group, (formerly of B-N Software Research Inc., now part of BNR Ltd.) conducted a research project to develop measurement techniques and collect data in order to assess the effect of electronic office systems on their users. Nineteen knowledge workers were given electronic work stations on an integrated office system for electronic mail, information retrieval, word processing, administrative support, and data processing. Data were collected from these among other areas, regarding their information requirements, time use, attitudes, communication patterns and compared to a control group in a pretest - posttest, quasi-experimental research design. The subjects' use of the system was also monitored on a day-to-day basis.

The result of the project show that, in general, it appears the system had a positive impact - improving the users' communications, time-use, access to information, attitudes towards office system technology, and quality of working life. One of the products of the research to date is a methodology for customizing systems to a given office. The method divides customizing into three phases. During the prepilot phase data are collected to design as good a pilot system as possible. During the pilot phase information is drawn from the users and the system itself to help evaluate and refine it. And during the operational office system phase, posttest and system monitoring data are combined with systems analysis data to enable the specification and cost-justification of a full operational system for the whole organization.

The methodology developed for and used in the Office Information Communication Systems project is now being used to evaluate the impact of office systems in other environments. Previous studies of office technology have measured only the efficiency changes resulting from the mechanization of a few office tasks, e.g. word processing. Other studies have recognized the far more pervasive implications of Electronic Office Systems for effectiveness changes, but have relied exclusively on subjective evaluations or opinions about productivity change. This is partly because of the difficulty of understanding 'knowledge workers', who are affected by an enormous number of variables that render it extremely challenging to determine that the use of an Electronic Office System resulted in a productivity change rather than some other set of variables, e.g. a change in management policy.

With subsequent tests our ability to collect valid evidence, and the evidence itself will grow. This will help to provide the information needed for useful product design, successful marketing and effective implementation of the new technology. The result should be better designed office systems - used, accepted and enjoyed by more office workers.