"Looking at 'Human Factors' in the Automation of Job Service Offices--A System Dynamics Approach"

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ABSTRACT

During the last 25 years manufacturing productivity has increased by 25%; yet, white collar productivity has only increased by 10%--and this in a society rapidly converting to white collar dominated service industries.

Office automation has been touted as the key to significant gains in white collar productivity, and one of the earliest users of such automation in government has been the Job Service of the U.S. Department of Labor. Early experiments in the 1960's with automated systems for matching employers and job applicants led to nationwide expansion during the last ten years. This expansion of automated systems has met with very uneven levels of utilization, performance, and integration into day to day operations.

Some reports of full integration or routinization of the systems and can't imagine trying to meet their performance goals without them, while others have abandoned automated matching systems altogether, viewing them as a serious impediment to their level of performance. Between these two extremes exist a wide variety of offices combining various available automated and manual options.

A recent nationwide study of the Job Service Matching System funded by the Department of Labor and the National Science Foundation found significant correlation between high rates of utilization of the automated systems and office productivity and general office effectiveness. Why, then, are automated matching and other automated systems under-utilized and ineffective in many locations where they have been introduced?

A growing body of literature places the blame on organizational elements, the "human factors". The study just mentioned has gathered considerable information on human factors and rates of utilization through questionnaires and interviews conducted annually for the past four years in 35 offices in 17 states representing urban, rural, large and small offices in a variety of economic and demographic settings. Preliminary results indicate that human factors are, indeed, significantly correlated with rates of utilization. A review of this study suggests that organizational acceptance (and utilization) of office automation is heavily influenced by a variety of human factors and, further, that these factors are strongly feedback oriented.

This paper presents a system dynamics model of human factors in the implementation of office automation in the Job Service. The model includes sectors representing model acceptance by managers, supervisors, professionals and clerks with the various factors impacting on such acceptance. Since the perceived usefulness of the automated system for office performance is quite important (especially for managers), sectors representing workflow and efficiency are also included.

The model suggests that individual human factor structures are embedded in larger feedback relationships which combine their effects into "macro-behaviors". The structure of these macro-behaviors may be a significant key to successfully dealing with the organizational problems of office automation. Policies addressed item by item to the multitude of social-psychological factors may be "missing the forest for the trees". Policy approaches which attack the problem through influencing the system at a macro-dynamic level are presented. It is hoped that such approaches might be illuminating to management strategists facing the prospect of major organizational change as a result of office automation.