

**COMPUTER AND CLERICAL JOBS:
THE MISSED OPPORTUNITY FOR WORK REDESIGN**

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As business managers we have missed a good opportunity. An opportunity that would have cost us little, one that had the potential of great return to our organizations. Such situations are unusual; they don't frequently occur. If my assertion is true, it warrants careful attention.

Quite simply, we've not used the implementation of Data Processing systems to improve workers' jobs. We could have made these jobs better; we could have used new systems as an excuse to make work more interesting. Instead, we have made these jobs worse. Not purposely, not consciously, but none the less, worse.

I am not making the usual pitch for job enrichment or enlargement. Such notions are not well received in the current political climate. This is not a time of great social consciousness. Rather, it is one of hard economic decisions. Enrichment programs are still controversial; while quality improvements frequently result, productivity gains are more questionable.

The point I am making is more straight forward. It is a result of two factors: the particular economic situation faced by our country and the consequences of applying computer technology to routine clerical jobs.

Current Situation

Our economic system is under enormous pressure. The notion of a mixed economy, that is a capitalistic system with a large, non competitive public sector, is being challenged as never before. Symptomatic of this situation is incessant inflation. While many factors contribute to inflation, it is generally agreed that the pressure for increased wages is one of the fundamental causes. In fact, many economists believe that we can not continue to increase wages, or we will be priced out of markets.

For many years, this country was able to cover high wages by productivity increases. However, as we shift from a goods producing country to one that provides services, the issue of productivity becomes more obscure. When there are few output measures, it is difficult to determine the factors that contribute to a service. Furthermore, services do not have the same economic benefit as products; they can not be resold and thus, contribute no multiplier effect to GNP.

As wages become a larger component of goods and services, and as wages continue to rise, it becomes even more attractive to substitute computer application systems for people. The issue here is not so much the loss of jobs, which most studies indicate are local displacements with frequent long term employment gains. The question is, 'what happens to the work of those that remain on the job?'

Three portraits of the resulting job tend to be discussed in the literature.

1. The worker did routine work. The application system relieved him of some of this work. As a result, the job is now less routine and more interesting. This is the optimistic view.
2. The worker did a variety of jobs. The application system constrains the worker, resulting in a job that is more specialized. This is the pessimistic view.
3. The job doesn't change. Factors other than the division of labor between worker and application system determine job composition.

Although it is difficult to generalize research findings to all situations, the results of two recent studies provide some insight about the relationship between clerical workers' jobs and computer application systems.

Turner (1980) investigated the nature of work related changes that occur when computer based systems are used to perform routine clerical functions and the likely organizational processes by which these changes take place. A micro organizational model was developed that related three outcome variables, clerical productivity, job satisfaction, and mental strain symptoms to the use and form of computer application systems through two task and two structural intervening variables. He concluded that productivity, mental strain symptoms, and job dissatisfaction were all positively associated with computer use intensity. Furthermore he showed that work related stress was the primary mechanism by which the use of computer based systems affects clerical workers.

In another study, Kling (1978) investigated the impacts of the use of computer systems on the jobs of data analysts and clerks in municipal governments. Respondents attribute increases in job pressure to the use of computer based application systems. These effects increase with the centrality of computing to the work. Kling concluded that computer use had a perceptible, but not dominant, effect on the jobs of many people.

The results of these studies are consistent with those of Bradley (1977) and Bjorn-Andersen (1976). Most of these recent studies of the impact of computer application systems on clerical workers, both here and in Europe, show a poorer job after the implementation of the system. No study shows a better job. At best there is no change in the job.

Explanations

Several explanations are possible for these findings. Possibly the outcome is purposely determined. The implementation of an application system presents an opportunity for work redesign. If management holds a pejorative view of workers, then it is reasonable for them to use every opportunity to make the job poorer. However, other than for ego gratification, there seems to be little reason to do so.

Another explanation is that the results just happened. They aren't consciously planned or intended; they are just the result of a number of related, but independent factors. Some support for this position can be found in Bjorn-Andersen and Hedberg (1977). They

studied the implementation of application systems for handling customer accounts in two Scandinavian banks. Both design teams attempted to tailor the new information technology to the existing organization and to make as few changes in the work roles as possible. Yet, they found unintended changes in work roles and structure within the banks.

It is well to ask just who are the decision makers in system implementations, and on what basis these decisions are made. All of us are aware of the prescription to involve users in application system design. Yet, there are many barriers to actual involvement. First, users especially at an operational level, tend to focus almost exclusively on the job at hand. They do not have the perspective to reconceive a system. Second, users are generally unfamiliar with the technology and its implications. Finally, most implementations involve political considerations which obscure important trade-offs. It is difficult not to conclude that, no matter how well meaning decision makers are, it is almost impossible to get real user involvement. Thus, technical managers tend to be the principal decision makers.

If technical managers are the key decision makers, do they tend to consider the redesign of work in their scope of activities? If system designers perceive job design to be outside their domain, then this might explain why systems appear to make clerical jobs poorer. There is some evidence to support this contention. As Bjorn-Andersen and Hedberg (1977) observe,

Both design teams believed that other groups in their organizations should be responsible for designing work roles ... In effect, the design teams singled out technology as their area of responsibility. They saw the design of work roles and organizational structures as being the responsibilities of other subunits in the bank. ... Work design lagged considerably behind technology design - to the extent that work design occurred at all. ... But these concerns (about teller's work roles) were not brought explicitly into the design processes; they remained informal insights about possible impacts on work roles, and they were never translated into design constraints or made the basis for formulating alternatives that would have met human needs (p. 127-29).

As Turner (1980) phrases it, major application system design decisions are usually made by technical specialists. These specialists, if left alone, tend to be guided by machine efficiency and implementation ease considerations. Part of this has to do with the designer's reward structure. Part has to do with technical specialists' preference for deterministic problems and a dislike for the ambiguity and uncertainty involved in dealing with people. Part also has to do with a lack of exposure to principals of work design. Thus, job design issues tend to be made by default.

If further support for this position is needed, one has only to look at the major Systems Analysis and Design texts. The design of work is seldom covered as a separate topic.

Let me summarize the key points of my argument. The implementation of a clerical application system represents an opportunity to redesign work. Most of the recent research evidence suggests that this process results in a poorer job. Key decisions about application systems tend to be made by technically orientated people who are not inclined to consider job design in their work

scope. To the extent job design is considered, it is usually after the fact.

It shouldn't surprise us that the job gets poorer. With no one concerned about the job, it degrades. This is sort of an entropy situation.

What should be done?

First, it is important to alter the way that technically orientated designers view application systems. Maybe each designer should be forced to use systems they develop for a period of six months. Short of this, changing the incentive structure would be helpful. We must start rewarding designers for meeting both technical and human needs. This can only come from the top. It would also be an improvement if work design became a normal part of System Analysis training and this material was reflected in text books.

Second, there are design methodologies that explicitly factor work design into the system building process. As a class these are called Socio-Technical Design approaches. Probably the most thoroughly developed is Mumford's ETHICS method (Mumford and Weir, 1979). These methods usually require more time for design and may be more expensive than traditional methods. Socio-Technical Design methods will tend not to be used until top management understands that these increased costs are more than offset by the quality of the resulting system.

Third, as managers we are being foolish, and this goes back to my original points at the beginning of this paper. Rather than continuing to use increased wages as the only form of compensation, we should consider substitutes. This has long been common practice with executives. Why not try to make the job better and view this as a form of compensation. Besides the saving in human capital, it might even reduce absenteeism and turnover. Research provides good support for these conjectures. For instance, Turner (1980) found that giving workers more decision making discretion in their jobs compensated for the added pressures of computer work as measured by decreased mental strain symptoms and job dissatisfaction. There is also evidence in the research that intrinsic job factors have a stronger effect on satisfaction than do extrinsic factors (Gruenberg, 1980).

Conclusion

When computer based application systems are introduced into clerical jobs, these jobs tend to become poorer. The reason for this is that most design decisions are made by people with a technical prospective. Job design is considered outside of their domain; it should be handled by someone else. While this position is perfectly understandable from the technician's prospective, management is missing an opportunity to use these new systems as organization development strategies. Jobs could be redesigned to make them better. The problem is that no one in an important position is concerned about this situation. However, the time is soon coming when managers will begin searching for substitutes to continual wage increases. When this happens the missed opportunity will be obvious, but by then it

will be too late.

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