Job Managing Assignments.. The Key To Combating Obsolescence

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ABSTRACT: *Data from 1200 engineers in three organizations indicate that: Job assignments are a major factor in determining future performance ratings and chances of being laid off. Managers tend to give the most complex jobs to engineers uncer age 30. Conclusion: engineers should be more aggressive in pursuing challenging job assignments.*

KEY WORDS: *Obsolescence, Education, Job assignments, Lay offs, Performance, Age.*

INTRODUCTION

The last ten years have seen a significant increase of interest in the problem of technological obsolescence. A recent article cites over 40 investigations of the subject since 1965 alone. [1] It is with more than passing concern that engineers must face the issue of maintaining their professional competence. The individual professional who employs techniques rendered outmoded by recent technological advances finds himself less effective in accomplishing his goals and those of the organization of which he is a member. This is followed by general dissatisfaction and discouragement. In an effort to deal with this ineffectiveness, the organization moves him into task situations where the requirements are not as dependent on current technology. And thus begins a cycle which, if continued over time, soon finds this professional hopelessly obsolete and, even worse, unable to do anything about it.

A compounding factor is that the *rate* at which technological knowledge and skills become obsolete is apparently increasing. Pelz and Andrews found that the performance of scientists and engineers peaked in the late forties and then began to decline, followed by a later period of productivity [2]. Using data collected a decade later, Dalton and Thompson reported that the performance of engineers peaks in the mid-thirties, falling off steadily with no later rise in performance [3].

Faced with these pessimistic results the individual engineer may well ask himself, "What can *I* do to avoid the problems associated with obsolescence?" In this paper we will present the key findings of a study designed to discover the answer to that question.

THE STUDY

The data for this study were collected from three companies, each employing a large number of engineers. These organizations included two that were primarily in the aerospace industry and one that was in a technology based commercial industry. The organizations studied were engaged primarily in design engineering, with the engineers performing various aspects of design work. A total of 1200 engineers and managers in several disciplines was represented in the study, including: electrical, mechanical, chemical, optical, and aeronautical engineers.

Continuing Education: Most of those who have written about "obsolescence" have proposed continuing education as the solution to the problem they see. Yet in this study, we found no statistical relationship between the number of courses taken in recent years and performance. In every age group, courses taken did not seem to help prevent declining performance. In fact, in three out of four age groups, the highest performers reported taking the fewest courses during the past three years.

In numerous interviews the engineers indicated that they learned about new developments as they were forced to do so in order to complete a project that required that specific information. They did feel that it was necessary to remain current but tried to accomplish this as a result of meeting the challenges of particular projects rather than by taking specific courses. This view was expressed so frequently by engineers and managers that it prompted us to take a closer look at the relationship between job assignments and obsolescence.

Job assignments: Management indicated that there were major differences in the kinds of jobs to which the men were assigned. Some jobs were highly sophisticated, "State of the Art" projects, while others were rather routine assignments utilizing established and traditional technology. In an effort to operationalize this concept, we asked all of the managers and supervisors to rank the jobs assigned to the men reporting to them. The following procedure was employed: each manager or supervisor was given a stack of index cards with the names of all the engineers reporting to him. The managers and supervisors were next asked to divide them into five categories according to the complexity of the assignments given each man during the past year. At one end of the scale would be those assigned to the most sophisticated jobs; at the other extreme would be those assigned the most routine jobs. Managers were specifically asked to rate the job assignment, rather than the way it was performed.

One might assume that a manager would assign his most capable (high performing) engineers to the most complex jobs. If that is the case, job complexity should be highly correlated with past performance. Our data, however, suggest another interpretation. Namely, that high performance ratings are more likely to *follow* experience in a complex task rather than *precede* such experience. Statistically, we found that when performance ratings were compared with past job complexity ratings the correlation was .73. But when the temporal sequence was reversed, that is, when job complexity was related to past performance the correlation was only .53. This difference proved to be highly significant ($p<.0005$).

We found another indication that job complexity is influential in affecting future performance ratings by way of an analysis of job complexity and performance ratings plotted against age. Figure 1 shows the average job complexity rating and performance rating of each of eight different age groups. Note that the peak years for complex job assignments occur five years earlier than the peak years of performance. The former comes in the late twenties while the latter occurs in the early thirties. If complex jobs were given to an engineer as a result of his high performance, we would expect the job complexity curve to peak *later* than the performance curve. The fact that the opposite is acutally happening is a major finding of this study.

One would predict from this finding that those in complex jobs would become and remain high performers, while those in less complex jobs would become the low performers. To test this prediction, we examined job complexity data for a large sample of engineers and matched this with their performance four years later. The data was first organized to obtain three subgroups of engineers whose jobs were considered, respectively, high (top one-third), medium (middle one-third), and low (bottom one-third), in *job*

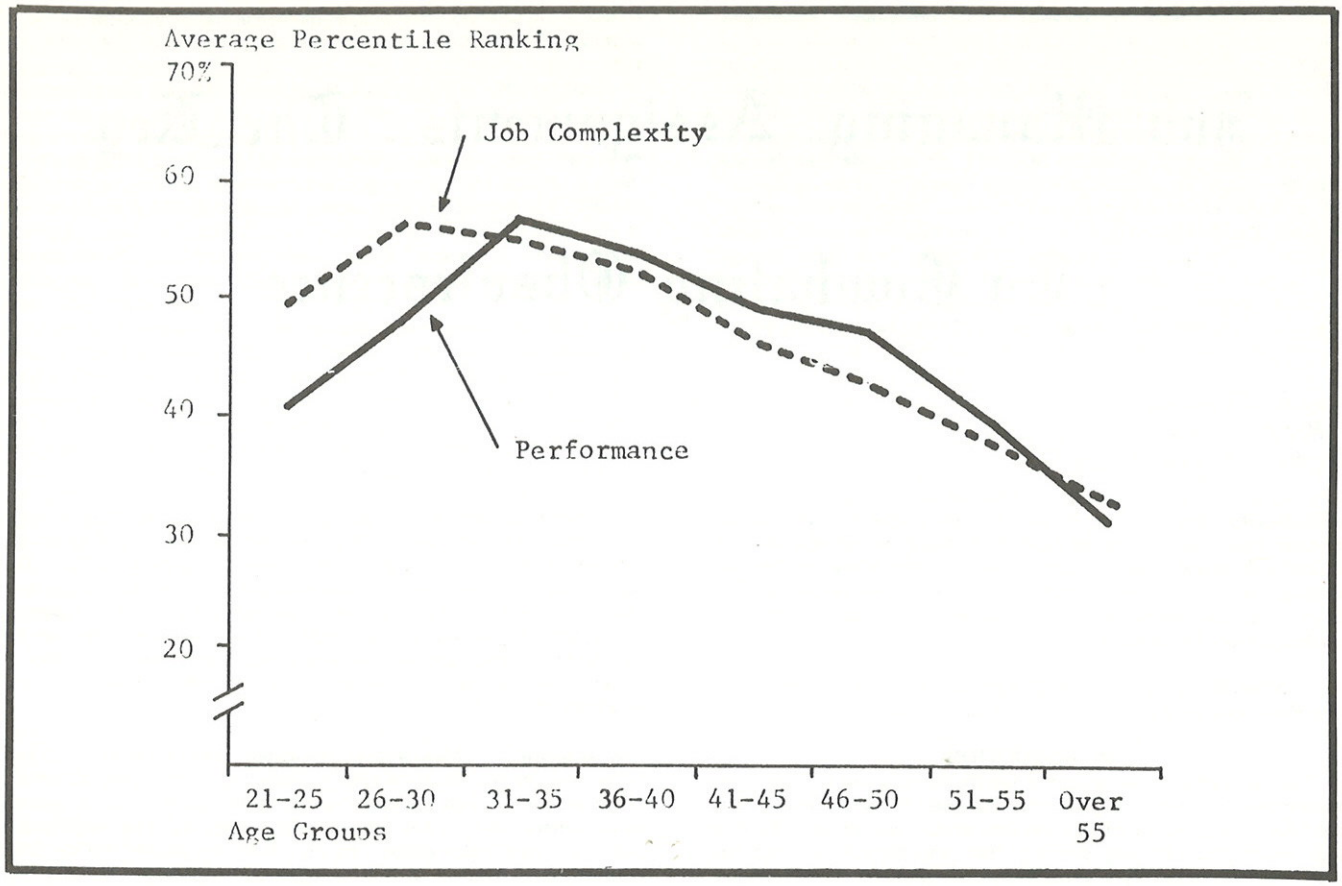

Figure 1. Comparison of Performance and Job Complexity with Age

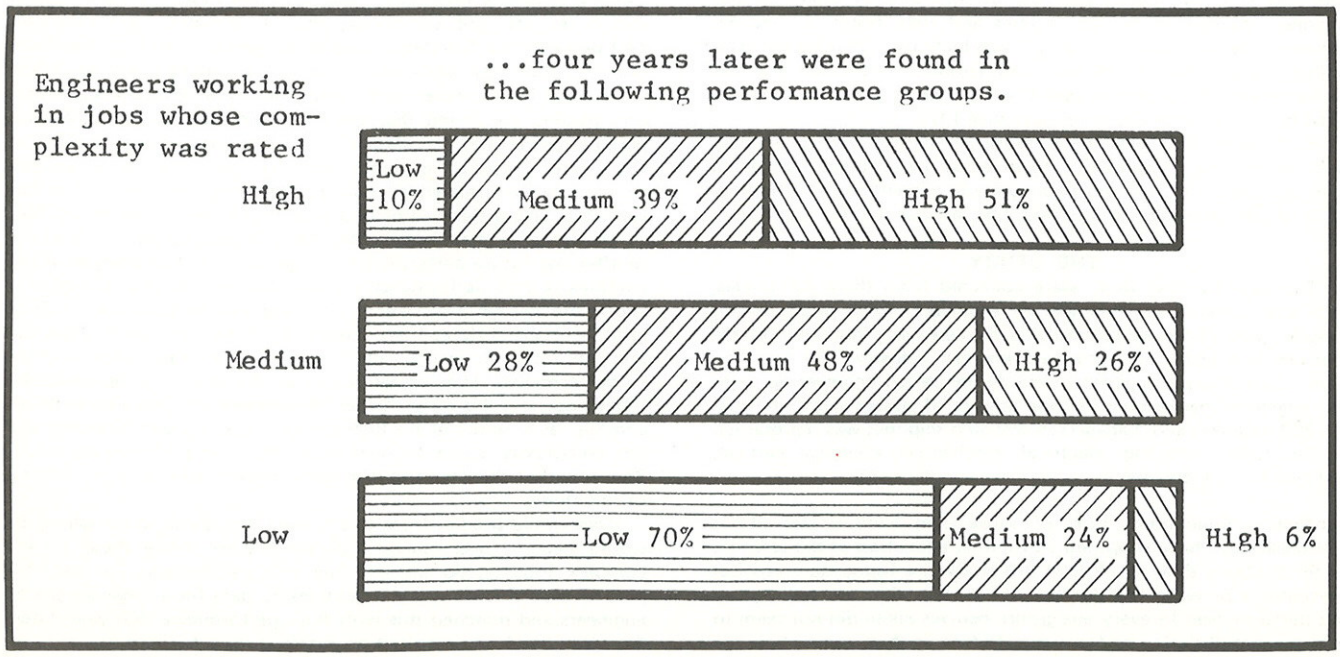

Figure 2. Job Complexity and Future Performance

complexity. Then the performance ratings of those in each group was examined to determine how many were in corresponding groups of high, medium, and low *performance* four years later (1973). As predicted (see Figure 2) the complexity of the job assignment was clearly reflected in subsequent performance ratings. For example, 94% of those in jobs considered low in complexity were medium or low performers four years later, while 51% of those in highly complex jobs were high performers four years later.

Job Assignment and Layoffs: There is also a strong negative relationship between the complexity of the job assignment and the chances of being laid off. Data gathered for another study indicate that those in less sophisticated jobs were more likely to be laid off than were those in complex jobs [4]. During the period 1969-1971, the organizations in that study laid off 26% of their total engineering population. However, the layoffs were not evenly distributed across all types of jobs. Of those who were working in jobs rated in the bottom third on job complexity 47.2% lost their jobs, while of those working in highly complex jobs (top one-third), the layoff rate was only 17.6%. It was also found that the complexity of a man's job was a better predictor of his chances of being laid off than his performance rating.

Job Assignment and Age: One of the most distrubing findings of this study (at least to engineers over 30) is that managers tend to assign the most complex jobs to the younger engineers. Figure 1, which was mentioned earlier, summarizes these findings. The average complexity ratings peaked in the late twenties and declined steadily thereafter. Those under age forty had job assignments above the fiftieth percentile, while those over forty had jobs in the bottom half of the complexity scale. When we have discussed this subject with managers they admit that often the best job assignments are given to the engineers in their late twenties and early thirties. One reason for such an approach is the manager has a deadline to meet and he wants the best person to help him meet the deadline. Apparently managers believe that a 28 year old engineer is the best person for the most challenging job. He hasn't been out of school too long so he remembers the latest concepts and he also has six or seven years of experience. Such a strategy might make sense in the short run but it is designed to destroy the organization's technical talent in the long run by depriving older engineers of the opportunities necessary to prevent obsolescence.

CONCLUSIONS

The findings of this study can be summarized in three major conclusions:

1. Job assignments appear to be a major factor in determining future performance ratings.
2. Engineers with less complex jobs are much more likely to be laid off than those with more challenging job assignments.
3. Managers tend to give the most complex jobs to engineers in their late twenties and least complex jobs to engineers over age forty.

These conclusions suggest that maintaining technical competence is a complex problem and no simple solution, such as taking a few courses, or reading technical journals is sufficient. Each engineer needs to take a long run orientation in planning his career. He has primary responsibility for remaining effective and that cannot be passed on to the company, the government, or any other institution.

Our findings indicate that every engineer should be more active in pursuing the kinds of jobs that will enable him to have a long and productive career. If his jobs in the recent past have not been challenging or used his skills adequately it is important to begin to exert more pressure on management to give him those kinds of assignments which will more properly prepare him for the future.

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