

OPERATIONAL CONSIDERATIONS IN IMPLEMENTING TAILORED TESTING

HAROLD SEGAL
U.S. CIVIL SERVICE COMMISSION

Based on the assumption that tailored testing is valid and feasible, the management of the U.S. Civil Service Commission has attempted to look at some of the practical problems involved with implementation of a large-scale tailored testing system and has established a task force that is interbureau and, to a great extent, interdisciplinary. The initial approach has been from the standpoint of applying marketing analysis techniques. It has, therefore, been necessary to look at the demographic characteristics of testing.

With regard to the Professional Administrative Career Examination (PACE), for example, the nationwide distribution of the locations where the test is given, the times of the year, and the concentration of test volume must be considered. The PACE Examination is administered in the 10 regional offices and in many of the 48 area offices of the U.S. Civil Service. About 90% of the applicants take the PACE Examination in approximately 12 or 14 locations throughout the country. This has implications for the potential computer configuration and the concentration of terminals needed. There will be a similar analysis of demographic requirements and test nature for the other examinations that are proposed for tailored testing before final feasibility judgements can be ascertained.

Organizational Problems

Organizational problems must also be addressed. The Civil Service Commission's Personnel Research and Development Center researches and develops tests. These tests are then channeled to the Bureau of Recruitment and Examination, which is composed of the operational personnel that operate the area offices and administer tests. The Bureau of Management Services controls the budget and is composed of management analysis and personnel specialists. Finally, the Bureau of Personnel Management Information Systems controls computer operations and manages the computer facilities; it is composed of analysts and programmers and is involved in all computer acquisitions.

A major problem is synchronizing all these organizational components and responsibilities within the total Civil Service Commission. If, in the near future, tailored testing is to become operational, solutions to managerial questions such as budget, logistics, hardware acquisitions, and software

development are mandatory before operation of a major system can occur. However, while these problems are being resolved, there will be continued research and development for tailored testing on an experimental basis.

Budgetary Considerations

About 90,000 PACE tests were administered in the first half of 1976 and about 160,000 tests in the second half of the year. This volume of testing has strong practical implications concerning how terminals will be set up, how many terminals will be needed, and how the potential flow of applicants will be facilitated. Work is already in progress to determine costs and investment in the automation of a certain amount of the recruiting and examining processes, but much financial analysis will be necessary to determine how this would impact on the budgetary process and be carried out over a number of years. For a large-scale operation, lead time of approximately three years in the budgetary process is required. There are a number of problems in terms of computer acquisition, however, which may extend the lead time for a longer period. Therefore, if implementation is to occur in the early 1980s, such questions must be answered very soon.

Plans are now being made to define various alternative strategies concerning how to proceed with tailored testing with regard to hardware and software problems. Consultants are now being identified, and the scope of operations is being broadened to some extent. Although present thinking is in the direction of a large central processing operation, the cost of telecommunications could be very high; this remains to be seen. Exact costs need to be determined first. Other alternatives such as distributed processing and the use of microprocessors must be considered. It is this type of alternative analysis which needs to be addressed in terms of the costs and configurations that will be required.

The PACE Examination

Approximately a quarter of a million PACE exams are given in a year, with a seasonal distribution; and there is little likelihood of equalizing them to provide an even distribution of test administrations. There are perhaps 12 to 20 locations in the country where, on a given Saturday, the PACE exam is administered to between 500 and 1,000 people. If the paper-and-pencil exams were computerized, this would mean a potential of 250 to 500 terminals on an interactive basis, 8 hours a day, for those days (or periods or months) that the PACE exam would be administered. Aside from the costs, it is difficult to conceive of a centralized computer system which would be capable of handling the peak workloads that now exist.

Consideration of the cost is presently underway with a short-term feasibility study related to an operational test; however, a set of additional studies will be needed as each major decision point is approached. Some studies will probably be required to use queueing models, relating walk-ins, volume of tests, volume of applicants, and number of terminals. Initially, an operational test or prototype will be scheduled for 1980 or 1981. There will be an attempt to build into that prototype the kinds of questions and information necessary to subsequently build a model of what a computerized nationwide system would look like.

Other Considerations

From the cost standpoint, there are three broad categories which are traditional for large computerized system developments: (1) the development costs, (2) the implementation costs, and (3) the recurring operational costs. These categories of costs would be added to the current budget, since the paper-and-pencil system will continue and will overlap with the implementation of any new system.

The need for parallel operations must be considered in the cost analysis. The size of the agency is such that if the magnitude of the dollars required to begin the initial implementation is too large, it would be virtually impossible to obtain the level of funding necessary, aside from insufficient cost/benefit justification.

In addition, there must be some understanding of latent trait theory and the impact it has on testing, whether or not latent trait theory is applied to paper-and-pencil tests or computerized testing. Presumably, this will mean that in the near future, an operation such as the U.S. Civil Service may have to re-structure testing with regard to item banks and test environment, whether or not there is such a changeover. There is a way to dove-tail the costs of both types of testing: If those items are changed which relate to latent trait theory and there is a movement in the direction of tailored testing, a development cost is needed, whether the tests are computerized or not.

Conclusions

The problem is to have the idea described in a context that management or key decision-makers can understand: What is the magnitude of the proposal? What is the dollar amount involved? Can the logistics be worked out? Ultimately, there will be a point at which the management questions will need to be satisfied before computerized tailored testing can become an operational reality. These are very expensive questions which need to be carefully considered. A quantum leap has been taken by accepting the fact that tailored testing will probably work; the U.S. Civil Service will likely go ahead at this point in time with regard to what is required over the next few years to get the decisions through the entire governmental process for ultimate implementation. Presently, the managerial questions are a very weak link between research and application. If there is no link bridging the research and practical application research satisfies intellectual interests only, but from an operational standpoint there will be minimal success.