Maintenance Performance

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During the next twenty years, there will be within the Army an unprecedented increase in both the number and sophistication of military systems. It is now important to recognize that modern and more efficient techniques are needed to manage the development and support of those Army personnel who operate and maintain these systems. The unique problems encountered in the development and support of personnel are illustrated below by comparing the life-cycle of military personnel with the life-cycle of military hardware. Following this comparison, a field-tested prototype management system (the Maintenance Performance System) which addresses these problems is discussed.

The life-cycle of a weapon system begins with a current or future mission requirement. Once the mission requirements are adequately specified, the weapon is designed, developed and tested. If the weapon does not perform to specifications, appropriate design changes are made and the system is reevaluated. When a satisfactory prototype is achieved, the system is mass-produced and fielded. To aid in the support of the fielded weapon system are performance measures such as probability of part failure, mean time between failure, mean down time, mean repair time, etc. Although these measures may be somewhat less than reliable, they establish an important standard against which support requirements can be anticipated. The Army-wide management of materiel is further aided by relatively rigorous and standardized data collection and reporting systems such as the Maintenance Control System (MCS).

The scenario above differs significantly from the development and support of personnel. Although personnel requirements are driven by and can be estimated from materiel characteristics, personnel cannot be mass-produced to meet those requirements. Rather, personnel developers (i.e., military trainers and educators) start with a heterogeneous group of recruits who differ in education, experience and motivation; probably none of these recruits arrive with any of the skills needed to operate or maintain military hardware. About the best that can be done at this point is classification of personnel according to more or less valid measures of aptitude, placement into Military Occupational Specialties (MOS) according to aptitude measures and manning requirements and, finally, enrollment for several weeks in an MOS-specific Advanced Individual Training (AIT) curriculum.

When "fielded," however, these soldiers are far from possessing more than the basic skill requirements for operating and maintaining hardware systems. Moreover, the development of any soldier's skill is never complete since the skill requirements change as a function of advances in grade, changes in equipment design, the fielding of new equipment, and unit missions.

Unlike military hardware, then, the development and support of personnel begins in large part AFTER they are placed into the field and continues for many years. According to Army doctrine, this development is to take place at the lowest organizational level and is to occur primarily in the form of supervised on-the-job training (OJT). However, unit level training managers and training supervisors have been provided with little in the way of guidance or resources to accomplish this training. The result has been a documented lack of proper and sufficient technical skill training. What is lacking at this point in the personnel life-cycle is an effective system to monitor the performance and utilization of personnel much as MCS monitors these factors for materiel.

As a first step toward addressing this problem in the management and delivery of unit level OJT, the US Army Research Institute (ARI) developed a prototype performance and training management information system for use at the direct support maintenance level (a more extensive system for use at the organizational maintenance level is under development). This system is called the Maintenance Performance System (MPS) and it is designed to identify training strengths and deficiencies, to locate available training resources, and to monitor the effect of training on job performance.

MPS is an automated maintenance management information system which provides to training supervisors up-to-date and unique information about WHO needs to be trained, WHAT tasks need to be trained, and HOW training can be accomplished. This information is presented in report form so that training opportunities can be easily recognized and taken advantage of within the context of a unit's available resources and constraints. Of equal importance is that MPS provides quantitative measures of individual and unit-level proficiency and efficiency (e.g., job completion time) so that the effects of training can be assessed.

Information for MPS is collected through the use of two simple input forms which are completed by technical MOS supervisors. One of the forms is attached to the job order packet and is used to record job performance data and OJT experience. The other form is used to record special training or the occurence of performance-based tests such as the Skill Qualification Test (SQT). Based on observations to date, supervisors spend about ten minutes each week completing these forms. A microcomputer is used to process the information and to print management reports.

As a means to improve the conduct and quality of unit level training, MPS is successful in several ways:

* ACCEPTANCE BY USERS: MPS has been operational for more than a year at two divisional FORSCOM maintenance battalions and is accepted by users as a system which provides timely, accurate and useful training-needs information.

* GUIDANCE OF TRAINING: MPS information is used to guide the course of training, to make job assignments, and to serve as a memory refresher about which repairmen require special training on critical skills.

* AUTOMATED JOB BOOK: MPS frees the training supervisor from making daily entries into each soldier's job book. As part of its regular report output, MPS provides each supervisor and individual repairman with an up-to-date record of OJT and other types of training.

* SKILL AND PERFORMANCE BANK: The historical records of skill and performance data provided by MPS constitute a skill bank from which battalion and company level management assess current unit proficiency and readiness.

* INCORPORATION INTO SAMS: MPS-like training information has been approved for incorporation into the Standard Army Maintenance System (SAMS). This is a milestone in that it represents the first systematic Army-wide collection of training and performance information, a vital step toward an improved and integrated training management system.

It should be noted that additional benefits accrue from the MPS data-base itself and that these benefits extend beyond the unit level. The maintenance performance information found in MPS can be used, for example, to target Army-wide skill deficiencies and fine-tune institutional training curricula, to pinpoint areas in which training materials need to be developed or improved, to estimate future manning requirements, to establish more reliable and comprehensive performance standards, to aid in the design of hardware, and to evaluate differences in training strategies and training management.

It is clear that the development of military personnel is different from that of hardware in two important respects: (1) skill development occurs largely after personnel are assigned to a unit, and (2) skill development continues for the duration of a military career. MPS was designed with these differences in mind and has been demonstrated to be an effective tool for the management of training and skill development. As we enter a period of declining available manpower and increased weapon sophistication, more attention will be focused on the quality of personnel and the need for systems such as MPS will grow.