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ANALYSIS OF DATA BASE COMPATIBILITY OF
THE STANDARD ARMY MAINTENANCE SYSTEM (SAMS)
AND THE MAINTENANCE CONTROL SYSTEM (MCS)
WITH THE MAINTENANCE PERFORMANCE SYSTEM (MPS)

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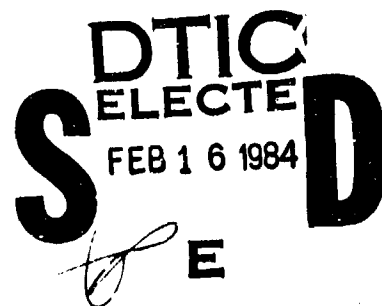
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INTRODUCTION

The purpose of this report is to compare the amount of duplication of data in the U.S. Army's current Maintenance Control System (MCS) and proposed Standard Army Maintenance System (SAMS) with the Maintenance Performance System (MPS) which is being developed by Anacapa Sciences, Inc.

CONTENT ANALYSIS

The compatibility of the type of data processed by each system was made by analyzing the content of each system's printed records. The printed records were obtained from the source documents listed in the **References** section.

The description of the analysis is divided into eleven sections corresponding to the eleven printed records provided by MPS. Each section includes a description of the MPS printed record followed by a description of SAMS and MCS, and conclusions regarding the compatibility of the data output of the three systems. An additional section describes the length of the reporting periods and the processing of data from previous reporting periods.

ROSTER

The **roster** provides repair technician names, primary MOS, paygrade, dates of employment, and a flag to indicate which personnel have not completed task experience forms. The minimum amount of information required for tracking personnel within the goals of MPS is provided. The roster, however, was not designed to fulfill the financial accounting and logistical tracking requirements of the shop unit.

SAMS

The **monthly employee master listing** report provides employee names, type of employment (enlisted man, military officer, wage board, or GS civilian), type of security clearance, and financial accounting information, such as hourly wage rate, health benefit program rate, and sick leave rate. The report also provides logistical information, such as number of employees and direct and indirect labor hours, according to the type of employment, as categorized above. This financial and logistical data is not required for MPS. On the other hand, the report does not provide data necessary for MPS, such as MOS, paygrade, and dates of employment.

MCS

No roster is provided.

Conclusions

The MPS roster provides data necessary for tracking purposes that are not duplicated by SAMS or MCS.

INTERPRETATION COMMENTS

Interpretation comments allow the system user to annotate the printed record to aid interpretation of MPS data output.

SAMS

No equivalent record is provided.

MCS

No equivalent record is provided.

Conclusions

Interpretation comments provide a permanent record to accompany other MPS data. Neither SAMS nor MCS appear to have a similar capability, at least not one that is automated. Presumably, the SAMS or MCS user could keep informal paper records to aid interpretation of print-outs.

MAN-HOUR AVAILABILITY AND USE

The **man-hour availability and use** record provides arithmetic averages for available, assigned, direct, and overtime hours for each tracked MOS.

SAMS

The **monthly labor utilization report** provides a statistic similar to MPS. Arithmetic averages for work center man-hours are computed for type of duty (such as time spent in maintenance training, maintenance meetings, and vehicle operations), but not for each MOS.

MCS

No equivalent record is provided.

Conclusions

In its present format, SAMS does not provide a record of man-hours for each MOS. MCS does not provide any record of available, assigned, direct, or overtime man-hours.

DIRECT MAN-HOURS PER JOB

The **average direct man-hours per job** record provides data for each MOS and equipment type.

SAMS

The **support maintenance mean-time to repair** record provides a similar statistic for equipment type. MOS, however, is not considered.

MCS

No equivalent record is provided.

Conclusions

Only MPS provides an average direct man-hours per job record for each MOS. SAMS appears to provide a similar statistic for equipment type.

DIRECT MAN-HOURS PER JOB BY EQUIPMENT AND TASK

The **average direct man-hours per job by equipment and task** record provides data for analyzing the amount of time needed for performing each task.

SAMS

The **task performance factor list** provides a record of the number of direct man-hours required to perform a repair task. The level of task description between SAMS and MPS is similar. For example, consider the replacement of the engine in a M113A1 armored personnel carrier. MPS provides the number of direct man-hours required to "replace engine/transmission/transfer (split-pack)." Similarly, SAMS provides the number of direct man-hours required to "remove engine" and "install engine" (removal and installation of the engine in the M113A1 requires the replacement of the split-pack). In all repair jobs that we reviewed, the action verb "replace" in MPS is equivalent to the action verbs "remove" and "install" in SAMS. This minor difference should provide little hindrance to data transfer between MPS and SAMS. However, we do not know if the action verbs "adjust", "inspect/classify", "align," and "service" in MPS have equivalent task descriptions in SAMS.

MCS

No equivalent record is provided.

Conclusions

MPS and SAMS records appear to be compatible, with the exceptions noted above in SAMS.

JOB COMPLETION TIME

The **average job completion time in days** record provides data for each MOS. For 63H, 63W, and 45K MOS's, the statistic is provided for equipment type.

SAMS

No fully-compatible record is provided since MOS is not included as a SAMS variable. However, the **support maintenance turnaround by ECC** record provides data for average job completion time according to type of equipment.

MCS

No equivalent record is provided.

Conclusions

Only MPS provides average job completion time according to MOS. SAMS provides a similar statistic for type of equipment only..

TIME SPENT IN EACH JOB STATUS

The **average days spent in each job status** record provides statistics for A, K, C, B, and R status changes. The statistics are computed for each MOS.

SAMS

The **maintenance turnaround time by unit/activity** record provides data for the average number of days spent in each job status according to type of equipment serviced. MOS is not considered.

MCS

The **workload accounting daily status sheet** is used to provide a paper record of status changes for each job according to shop section (such as automotive or communications), which may or may not correspond to distinctions between MOS's (for example, the automotive section may have repair technicians having 63G, 63H,

or 63W MOS's while the communications section has repair technicians having only 31E MOS's). A summary of the number of jobs in each status is provided by the **shop workload summary** and **battalion workload summary** records.

Conclusions

SAMS provides a statistic similar to the MPS record for average number of days spent in each job status. SAMS, however, does not consider MOS. MCS provides a summary of the number of jobs in each job status, but not the amount of time in each job status. Neither SAMS nor MCS considers MOS; statistics are computed according to shop section or type of equipment.

SKILL AND GROWTH INDEXES

Skill and growth indexes are computed for each repair technician by a formula that considers task training, number of times that the task has been performed, and demonstration of task proficiency.

SAMS

No equivalent record is presently provided by SAMS. Currently, the only task performance parameter in the SAMS records is the number of direct man-hours required to perform each task. Additional task performance parameters will be tracked in the Divisional Materiel Management Center (DMMC) level system (SAMS-2) when it is installed in the mid-1980's. How the additional task performance data will be analyzed is not discussed in the SAMS documentation in Anacapa Sciences' files.

MCS

No equivalent record is provided.

Summary

The skill and growth indexes record is unique to MPS.

SKILL DEVELOPMENT SUMMARY

The **skill development summary** provides arithmetic averages for each MOS. Its source is the **skill and growth indexes** record which tracks the performance of each repair technician.

SAMS

No equivalent record is provided. See **SAMS** in the preceding section for additional comments.

MCS

No equivalent record is provided.

Conclusions

The skill development indexes record is unique to MPS.

INDIVIDUAL SKILL HISTORY

The **individual skill history** record provides task performance data for each repair technician. The statistics are computed using measures of task training, number of times that the task has been performed, and demonstration of task proficiency. The record differs from the **skill and growth indexes** record in that statistics are given for performance of each task rather than overall job performance.

SAMS

No equivalent record is provided. See **SAMS** on page 6 for additional comments.

MCS

No equivalent record is provided.

Conclusions

The individual skill history record is unique to MPS.

TRAINING REQUIREMENTS SUMMARY

The **training requirements summary** record tracks the training requirements for each repair technician. Task performance that is below a predetermined criterion is obtained from the **individual skill history** record. The training requirements summary record provides training resources information when repair technician task performance is below criterion.

SAMS

No equivalent record is provided.

MCS

No equivalent record is provided.

Conclusions

The training requirements summary record is unique to MPS.

Content analysis of SAMS and MCS compatibility with MPS is summarized in Table 1.

TABLE 1
Summary of the Content Analysis of the Compatibility
of SAMS and MCS Records with MPS Records

(● = Fully-compatible record, ◐ = Partially-compatible record, ○ = No compatible record)

MPS RECORD	SAMS	MCS
Roster	◐	○
Interpretation comments	○	○
Man-hour availability and use	◐	○
Average direct man-hours per job	◐	○
Average direct man-hours per job by equipment and task	●	○
Average job completion time	◐	○
Average time spent in each job status	◐	◐
Skill and growth indexes	○	○
Skill development summary	○	○
Individual skill history	○	○
Training requirements summary	○	○

REPORTING PERIODS

The MPS records include data from the current and the twelve prior reporting periods. Each reporting period is two weeks long. However, because of the slow rate of change of training and skill acquisition, the **skill and growth indexes, skill development summary, individual skill history, and training requirements summary** are provided every six weeks.

SAMS

SAMS-1, which will be installed at the support maintenance level, provides records daily on a user-demand basis. SAMS-2 will provide reports on a daily or weekly basis depending upon the rapidity of magnetic tape or disc transfer from SAMS-1 to SAMS-2. SAMS-2 also provides reports on a user-demand basis. Neither SAMS-1 nor SAMS-2 incorporates data from prior reporting periods into the records for the current reporting period.

MCS

The MCS records provide data for only the previous one-week reporting period.

Conclusions

Only MPS records provide historical trends for each statistic. MCS provides data for only the current reporting period. SAMS provides reports on a user-demand basis, but does not incorporate historical data into the record for the current reporting period.

REFERENCES

- Jackson, D. K. Retail SAMS. **Army logistician**, October 1980, 17-19.
- Simpson, H. K., Fuller, R. G., and Harper, W. R. Santa Barbara, California: **Develop and evaluate training and performance systems for maintenance jobs. Volume III: Development of output formats, processing, and collection procedures.** Santa Barbara, California: Anacapa Sciences, Inc. First Interim Report, 1980.
- U. S. Army. **Logistics management: maintenance reporting and management (MRM) subsystem** (TM-38-17), Washington, D.C., 1 May 1976.
- U. S. Army. **Standard-army maintenance system (SAMS) briefing notes.** U.S. Army Logistics Center: Fort Lee, Virginia, 1980.
- U. S. Army. **Standard army maintenance system (SAMS) print-outs** (Received from M. Drillings, U.S. Army Research Institute for the Behavioral and Social Sciences, 5 November 1980).