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How Hanes Hosiery Uses Clerical Work Measurement

Thomas G. Eshelman

Although the use of work measurement in the office is growing, many are still skeptical of its effectiveness, particularly in small organizations. This case history — from a 90-person office — illustrates —

HOW HANES HOSIERY USES CLERICAL WORK MEASUREMENT

by Thomas G. Eshelman

Hanes Corporation

THROUGH a carefully planned management approach, Hanes Hosiery Division of Hanes Corporation, Winston-Salem, North Carolina, has succeeded in puncturing two popular myths about clerical work measurement: that industrial engineering techniques originally designed for the factory won't work in the office and that a company needs a giant office force to get any real savings.

We have an office force of about 90 people. After two years of experience with office standards we have slightly more than half of our clerical jobs covered. Employees on these jobs perform, on the average, at about 85 per cent of standard. We calculate this to be an increase in efficiency of approximately 15 per cent, which, for the jobs studied, comes to some $27,000 a year.

But savings, helpful though they are, aren't the whole story. For us, the greatest benefit has come in the form of improved management planning and control. Actually, we would hate to think how we could have managed to run the office without work measurement. Its chief value comes from knowing how many people you need and from knowing when work loads are reasonably equitable.

We undertook work measurement in the office because clerical costs were rising out of proportion to the sales growth curve, steep though that was. Our aim was to bring these costs into line and under a reasonable degree of control. We were interested primarily in skimming the cream of potential savings, not in engaging in a perfectionistic exercise.

Before the program was initiated, management set some firm ground rules:

1. Supervisors would have a key role. They would be brought into the program early, given an understanding of the principles of meas-

urement, [illegible] participate.

2. No one would lose his job because of the program. Excess personnel would be given temporary assignments, retrained — even paid to stay home if necessary. Normal attrition would, it was hoped, balance employment needs over time.

3. An outside consultant would be used. Although Hanes' industrial engineering department had had extensive work measurement experience in the plant, we recognized that a different type of expertise was required to bring standards to the office. Furthermore, the psychology of application would be quite different.

4. Patience and moderation must prevail. Although we hoped that the program would progress with "all deliberate speed," we did not want anyone to be put under excessive pressure for results.

MCD technique

After investigating several possible sources of outside assistance, Hanes retained Serge A. Birn Company, Louisville, Kentucky, management consultants with considerable experience in clerical work measurement. The Birn organization had developed the work measurement technique of Master Clerical Data (MCD), a simplification of Methods Time Measurement (MTM) especially suited to clerical applications.

MTM, as was explained more fully in a previous issue of *Management Services* (see M/S, November-December '65, p. 35), provides a set of tables of established time values for the basic motions required to perform common tasks in industry. These time values were determined originally from study of micromotion films showing workers performing basic motions. A number of workers were studied and their times averaged to arrive at a time standard considered to be that of an average worker of average skill working at an average rate of speed.

To set a time standard for a task, the analyst records the motions [illegible] standard time value for each motion involved, and adds them all up. Thus, the analyst does not have to do his own timing (by a stop watch or other means), but he does have to be able to break the task down into its component motions.

The motions timed are extremely basic — for example, reach, grasp, and release — and the times required to perform them are minute. For this reason, MTM has its own time unit, the TMU (Time Measurement Unit), which is equal to one one hundred-thousandth of an hour or about one twenty-eighth of a second.

Under the original MTM system, a one-minute operation may involve several hundred motions requiring several pages of forms for recording. Obviously, the time and effort the analyst must spend to do this are worth while only for highly repetitive operations.

As a result, the more advanced predetermined time systems in use today utilize tables of standard times for much broader groupings of motions than such basic MTM measurements as "Reach to object in fixed location six inches away." This grouping of motions may make the time values slightly less accurate. (Actually, tests have shown they seldom vary more than 5 per cent from those calculated with the MTM tables.) But it makes the technique a practical one for work that is not repetitive enough to make the detailed analysis of basic MTM economical. Clerical work is an obvious example.

MCD offers tables of time values of motions combined in such a way [illegible] suited to analysis of clerical tasks. The motion patterns are broad enough to be readily identified and recorded by any intelligent person with a little training; the analyst need not be an industrial engineer provided he or she is taught the technique by a qualified professional.

Our standards were set by an intelligent girl selected from our own office staff and trained on the job by the consultant. She did most of the work, under the general supervision of the author (who was then office manager). A member of the Hanes industrial engineering department also participated in the MCD training and assisted in setting initial standards; the MCD analyst is now in the industrial engineering department. The role of the consultants was essentially to train us, to assist in the first installation, and then to make themselves available for whatever follow-up counseling was needed.

Developing standards

The payroll department was selected for the initial installation. From discussion of the departmental work with the supervisor the analyst prepared a list of the actual tasks performed in the department. She then observed an employee or two in action performing each task. Her observations of the procedures used, on which she made detailed notes, were supplemented by interviews with the employees.

For each task she then prepared a Clerical Methods Analysis Sheet (or "Pattern"), shown in Figure 1 on page 39. The first column on this sheet lists the motions used in performing the task. The motions are identified by their MCD code, which utilizes an alpha-mnemonic system for quick identification. GBT, for example, means Get Batch (of papers or cards) and aside to Table. GST means Get Single sheet (or card) and aside to Table. Additional information about the motion, if necessary, is recorded in the column headed Description.

THOMAS G. ESHELMAN is assistant treasurer of Hanes Corporation, Winston-Salem, North Carolina. Before assuming his present position, he served as manager of data processing, office manager, secretary, and vice president - administration for the Hanes Hosiery Division of Hanes Corp. He is a former president of the Data Processing Management Association and vice president of the Administrative Management Society.

Work units are the standard time values (in TMU's), obtained from the tables on the MCD card (see Figure 2 on page 40). Frequency is the number of times the motion is used in the particular phase of the job referred to; it is recorded from the analyst's notes of her observations and interviews. The analyst multiplies the number of work units by the frequency to determine the total work units for each element and then adds the work units for the various elements to get a total for the task (11,548 TMU's in the case of the job illustrated in Figure 1).

Judgment and experience are required both in the identification of motions and in the choice of a unit of performance in which the standard will be quoted – number of cards handled, number of words typed, number of total occurrences, and the like. In this case the analyst noted that 150 was an average number of cards handled, figured the total work units on this basis, and then divided the total by 150 to arrive at a figure of 77 work units per card. Thus, the standard becomes usable no matter how many cards the girl actually sorts on a given day.

When all the "patterns" in a particular group of tasks had been completed, they were summarized on the Job Summary form shown in Figure 3 on page 41. The first three columns list the summary job codes and the task codes for the tasks studied, with descriptions. In the fourth column the standard TMU's per unit are totaled for each job. The last two columns show the average number of units for the job and the standard time for that number of units (in hours rather than in TMU's). This form, which is largely for the analyst's own reference, enables her to tell at a glance what the total times for average jobs are in standard hours.

Finally, the codes and standards were punched on cards and stored in the computer, where they are used to calculate weekly performances as percentages of standard performance.

After completion of the methods

MEASUREMENT METHODS
ANALYSIS SHEET

Summary No. 0101

Operation No. 0101
Sheet 1 of 1

Dept. Payroll

Job Knitting Dept. Payroll

Operation Record of Machine Hrs. Lost by Knitters - Sort into groups for Days or Hours

Date 11-25-64 Revised _____ Analyst _____ Operator _____

MCD CODE	DESCRIPTION	WORK UNITS	FREQ.	TOTAL UNITS	SEQ. NO.
GBT		49	2	98	
GST	into groups	36	150	5400	
GBT	each groups	49	2	98	
Hi	straighten	5	8	40	
				5636	
	Sort these 2 groups into other groups				
GBT		49	2	98	
GST		36	150	5400	
GBT		49	6	294	
Hi		5	4x4	120	
				5912	

CODE	IDENTIFICATION	FREQUENCIES	TOTAL WORK UNITS	11548
	Avg. 150 Cards Weekly. this is done on Monday	per 1 Card	77	

FIGURE 1

analysis and the setting of standards in the payroll department, the same technique was applied to other clerical departments at Hanes. A slightly different approach was used for key punch operators and verifiers. Because of the repetitive nature of the key punch operation, a more detailed analysis is economically justified. For key punch operations we used a special set of time values, developed by the consultants, which was based on a finer breakdown of motions. Since it was found that verifying can be done more rapidly than punching, standards for verifiers were set at 92.2 per cent of those for key punch operators.

Setting the standards was, of course, only the first step. What counts is the way they are used.

The system we set up for applying the standards does, of course, involve some paperwork. The basic record is the Daily Task Report (shown in Figure A on page 42) maintained by all clerical employees. Each employee has her own form, which lists every task she normally performs and reminds her of its unit of measure.

MASTER CLERICAL DATA CARD

BODY ELEMENTS	
Code	Time
BSA	208
BSS	122
BV	61
BW	17

EYE ELEMENTS	
Code	Time
ED	11
EM	(1 Per Inch)
EDRO1	7
EDRO2	11
ERWO1	5
ERWO2	11
ES	11

GET AND ASIDE ELEMENTS			
Get		Aside	
Code	Time	Code	Time
GB	29	GF	25
GL	28	GH	20
GMO	16	GPB	37
GMJ	25	GPS	34
GSO	19	GTB	20
GSA	15	GTL	31
GVO	21	GTS	17
GVJ	29	—	—
GET AND ASIDE COMBINED			
GBF	54	GSF	44
GBH	49	GSH	39
GBP	66	GSP	53
GBT	49	GST	36
GLT	59	GVFO1	46
GMFO1	41	GVFO2	54
GMFO2	50	GVHO1	41
GMHO1	36	GVHO2	49
GMHO2	45	GVTO1	38
GMTO1	33	GVTO2	46
GMTO2	42	—	—

MAILING ELEMENTS			
Code	Time	Code	Time
MAA	30	MFSO2	258
MAF	60	MFSO3	47
MAE	35	MFSO4	212
MAH	99	MFSO5	49
MAP	82	MILO1	49
MEB	163	MILO2	85
MEI01	50	MISO1	13
MEI02	62	MISO2	56
MEO01	47	MISO3	49
ME002	39	MPA	21
MESO1	80	MPMO1	37
MESO2	195	MPMO2	11
MESO3	95	MPSO1	99
MFMO1	11	MPSO2	24
MFMO2	—	MPSO3	26
MFSO1	95	MSA	49

CALCULATING ELEMENTS	
Code	Time
CAE	16
CAKO1	5
CAKO2	6
CATO1	19
CATO2	26
CCCO1	6
CCCO2	12
CCCO3	12 + 3.5C
CCD	10 + 29D
CCEO1	9
CCEO2	13 + 3.5C
CCKO1	5
CCKO2	7 + 5D
CCMO1	15 + 22D
CCMO2	22D
CCR	5 + 3.5C
CCSO1	10
CCSO2	12
CCSO3	18
CMA	15D + 7C + 11
CMC	11
CMD	(106 + 89d) Q
CMM	52Mm + 40m + 29
CMS	15D + 22C — 4

FASTENING ELEMENTS	
Code	Time
FBS	55
FCP	50
FCTO1	65
FCTO2	28
FP	108
FSHO1	46
FSHO2	35
FSTO1	37
FSTO2	20
FSR	52
FTC	84

HANDLE PAPER ELEMENTS			
Code	Time	Code	Time
HCI	39	HJCO1	5
HCF	66	HJCO2	9
HCA	48	HJSO1	8
HDG	25	HJSO2	12
HDH	115	HPH	30
HDI	36	HPS	47
HFGO1	84	HPI	36
HFGO2	100	HSF	23
HFNO1	44	HSG	27
HFNO2	60	HTC	32
HFSO1	63	HTN	23
HFSO2	79	HU	30

OPEN AND CLOSE ELEMENTS			
Code	Time	Code	Time
OBA	173	ODK	53
OBCO1	48	ODL	68
OBCO2	73	ODS	21
OBP	67	OF	98
OBR	62	OTC	106
ODDO1	62	OTF	95
ODDO2	76	OTH	35
ODF	77	OTL	71
ODH	74	OTS	69

LOCATING ELEMENTS			
Code	Time	Code	Time
LCA	22	LFS	18
LCG	40	LGF	4
LCS	14	LGT	9
LFA	31	LIE	28
LFG	48	LID	35

TIME CONVERSION TABLE

1 UNIT	= .00001	hour
	= .0006	minute
	= .036	second

FIGURE 2

The tasks are grouped in the order in which they are usually performed.

Every day the employee records the number of units of each task she completed that day. At the end of the week she turns the report in to her supervisor.

The work measurement analyst checks the sheets for obvious errors. (The employee may, for example, have recorded the wrong units or put a figure in the wrong box.) Then she extends the totals and enters the identifying code numbers for the department and the employee, the actual hours worked (from the employee's time card, which is punched in and out daily), and the employee's time allowance for personal time, delays, and the like.

The completed task reports then go to the key punch department, where an operator records on punched cards all the important information (the analyst's entries and the first and last columns of the report—the task code numbers and total frequencies for the week). The result is a deck of IBM cards for each employee, one for each task she performed during the week.

Since the key punch operators and verifiers have more standardized jobs, their daily task reports are simpler. The operator simply lists the job code number (which is on the program card that she loads into the key punch machine for each assignment) and the number of cards punched. (She gauges the number of cards with a special ruler that gives a sufficiently accurate estimate.) The verifier's report is similar except that she enters the number of errors found and the code numbers of the operators responsible for them.

Cards containing errors are returned to the operators who made them. The time they spend correcting the errors is charged against their time allowances for delay and personal time. This helps to keep errors under control.

The daily reports for the punchers and verifiers are punched onto cards after the analyst has entered the actual hours worked (from the time clock).

All the cards are processed by the IBM 1401 computer, which produces two reports. The Departmental Summary, illustrated in Figure B on page 43, shows actual hours worked by each employee (in the first column on the right-hand side of the sheet), hours of standard work (in the third right-hand column), and performances as a percentage of standard, including appropriate allowances (in the last column). At the bottom of the report the computer supplies totals for the department. To accomplish this, the computer is loaded with the deck of standard times for all tasks so that it can multiply by frequency and then

adjust for appropriate allowances.

To the computer printout the analyst adds the comparable departmental performance percentage for the previous week and a four-week average. The completed departmental summary is given to the departmental supervisor on the Wednesday following the week the work of which is covered.

A more elaborate report, prepared automatically by the computer, shows the total amount of work done — by task, not by employee. This report is used by the analyst as a rough check on employee reports, but its principal application is as a guide in scheduling work and balancing work loads.

For the office manager the analyst prepares an overall Office Performance Report (Figure C on page 43). This shows actual and standard hours and performance as a percentage of standard for each department and for the entire office. The overall performance rating is compared with that for the week before. To this report are attached copies of the detailed reports (by employee), in case the office manager wants more detail.

Dept: 01 PAYROLL
Date: 1-28-65

P. 1 of 2

JOB: 0100 KNITTING DEPT. PAYROLL

	Summary Code	Task Code	DESCRIPTION	TMU Per Unit	Unit Of Measure	Variable	Total Standard Hours
			RECORD OF MACHINE HRS LOST				
	0101	101	SORT FOR DOZ. OR HOURS	72			
RATE	0.0064	102	COMPUTE MONEY & PUT ON CARD	205			
		103	COMPUTE DOZENS & PUT ON CARD	359			
				636	1 CARD	150	W. .95
	0104	104	SORT CARDS TO LINE NO.	114			
RATE	0.0029	105	CHECK STYLES FOR VALIDATION	174			
				288	1 CARD	150	W. .43
	0106						
RATE	0.0013	106	ADD FINER NEEDLE CARDS	129	1 CARD	381	W. .49
	0107	107	FIND OPERATOR NOS. TO GO ON AVG.	74			
RATE	0.0026	108	FIND AVG. RATES FOR OPERATORS ON AVG.	184			
				258	1 OPER.	120	W. .31
RATE	0.0284	109	COMPUTE & WEEK AVERAGES	2535			
			PLUS #107 & 108 ABOVE	258			
				2793	1 OPER.	50.	W. 1.42
	0110	110	CHECK SUMMARY SHEETS	59582			
RATE	43458	111	PHONE CALLS, CONFERENCE WITH FOREMAN	25000			
				134582	WEEKLY	1	W. 1.35
RATE	0.0333	112	CHANGES TO SUMMARY	3332	1 CHANGE	30	W. 1.00

FIGURE 3

Use of reports

The office manager receives his summary of departmental performance weekly and scans the figures. He expects some fluctuation and frequently knows by experience, without further investigation, what the causes are.

Even when a department seems to be lagging, the office manager never takes action on the basis of one or two reports. He knows that the departmental supervisor sees the report, too, and will probably correct the situation on his own if left to do so. Only when a problem persists for several weeks does the office manager intervene.

Departmental supervisors note individual performance records and use them as a guide in managing. They watch for trends and check progress of new employees. Key punch operators and verifiers receive personalized summaries comparing their own performance with the averages for their departments. Other employees do not see their performance ratings, but they know they are being measured.

Supervisory reaction

At Hanes, as in most offices without previous experience in work measurement, both employees and supervisors were skeptical at first. But management enlisted the supervisors' aid from the outset; they were invited into the early planning and were kept informed through the installation. The program was not presented to the employees as a major change; they were encouraged to take it for granted as another logical step in a well managed company.

As a result, supervisors are generally pleased with the MCD program. One year after its installation one supervisor listed the following benefits:

1. Work measurement makes possible fair, unbiased evaluation of each operator's production performance.

2. It provides a means by which a supervisor can follow trainees' week-to-week progress closely and compare it with that of earlier trainees.

3. Operators are stimulated to increase their level of production even without pressure from their supervisors. Most people are naturally competitive and want to be the best — or at least among the best. An operator is not discouraged from working hard for fear that her effort will not be noticed; she knows that it is reflected in her weekly efficiency rating. On the other side of the coin, she is discouraged from wasting time between jobs because she knows that unproductive time will show up in the rating. In fact, when there is not enough work to go around, operators even compete for the work that is available.

4. The reports bring to the

DAILY TASK REPORT

DEPT. 213 ORDER AND BILLI NAME 214 [redacted] WEEK ENDING 5/30/65

CODE	TASK DESCRIPTION	PER ONE UNIT	M	T	W	T	F	S	TOTAL
711	CHAIN STORE-TYPE ON 632	INVOICE		4	1	2	=		
712	PINK ORDER-TYPE ON 632	INVOICE		10	7	22	--		
717	DITTO COPIES OF J CASES	DAILY		✓	✓	✓	-		
	TRAVELER PREPARATION								
611	RUN FIN TRAV ON DITTO	INCH		6¼	-	5¼	-		
609	TYPE FINISHING MASTER	MASTER		65	81	46	139		
612	CHECK FIN TRAV AGAINST ORDER	MASTER SET		44	108	31	78		
613	CHECK OFF AND SEP FIN TRAV	MASTER SET		44	108	31	139		
616	SORT FIN TRAV TO STYLE	COLOR BATCH		140	70	110	280		
617	SORT FIN TRAV TO COLOR	STYLE		140	70	110	280		
618	CHK FIN TRAV AGAINST DYE SHEET	COLOR BATCH		140	70	110	280		
624	RUN MENDER TRAV ON DITTO	BATCH							
501	ASSIGN LIST NUMBERS	LIST NO			342	116	161		

FIGURE A

supervisor's attention any operator who is falling below the average range of the group. This enables the supervisor to manage by exception, giving extra help to enable this operator to improve her performance. The question of whether she really is producing at a level below par cannot become an issue, as it does in many offices without work measurement, because the supervisor is not acting on the basis of a general impression; he has figures to back up his contention.

5. Consistently sub-par operators can be weeded out relatively easily. Without the aid of clerical work measurement methods, the supervisor might have more difficulty spotting them.

6. The objectivity of the system reduces hard feelings on the part of operators who must be terminated. They tend to accept the decision, not as a personal evaluation by the supervisor but rather as the result of their own inability to meet predetermined standards that the other operators are able to meet.

All this has required — and still requires — some investment of time by management and employees. After the training phase was completed the analyst spent most of her time for the next year on the program—studying additional jobs, maintaining records on those already studied, and updating standards to incorporate any changes in methods or work content. Loosely maintained standards can wreck any measurement program, so we resolved from the beginning to keep standards current. In the first year of the program, as it went through its shakedown period, updating took half of the analyst's time. Now, however, partly because the program is operating smoothly and partly because the computer does most of the work, updating requires only a couple of hours a week.

The computer plays a significant role in enabling us to get full benefit from our office standards. The paperwork, if done manually, would take at least two days a week of the analyst's time. Now, however, it takes only about half a day a week of her time, a couple of hours a week of keypunching, and a weekly fifteen-minute run on the computer.

The project also took about half of my time as office manager for the first six weeks. This may seem like a lot, but we were convinced that someone in office management had to be deeply involved in a program like this to insure its success. We felt we were on the right track, and we did not want to risk failure by neglecting to give the MCD program full management attention from its initiation through its completion.

The results have been highly satisfactory. As was indicated earlier, we did not approach this as a pure engineering study; we were not looking for a textbook appli-

cation. All we wanted was some kind of yardstick — not necessarily a perfect one, just something that would be better than nothing. We felt that it would be enough to cut out most of the fat.

It is hard to say what the results might have been with a more perfectionistic approach, but these typical departmental improvement records seem impressive enough to us:

Payroll—In just over two months after the program was initiated, the payroll department had been reduced from eleven to nine people. Before standards, performance averaged about 63 per cent of standard. Now it averages 85 per cent — an improvement of more than one-third.

Order and billing—Supervision in the order and billing department was better at the outset. Even so, the improvement netted out at 12 to 15 per cent.

Key punch—The key punch department had already been measured — by a system that the girls resented. Nevertheless, under the new program performance increased 10 per cent.

In 1960 and 1961, before installation of the MCD system, Hanes' office force increased 55 per cent, from 63 to 98 people. Sales were growing during this period, too, but hardly at that rate.

Since work measurement was introduced, Hanes' volume of business has continued to increase. But now the office force is down 11 per cent, to 90 people. The trend of increasing labor costs in the office has been reversed. The work measurement program is not the only reason for this improvement — computers were also installed in this period — but we are inclined to give MCD at least three-fourths of the credit.

Measurement is our unseen supervisor. The simple fact that people have to report what they are doing every day is in itself worthwhile. Employees unquestionably work harder if they feel the boss knows what they are accomplishing.

DEPARTMENTAL SUMMARY

2	201	[redacted]	37 25	32 14	86%
2	202	[redacted]	37 75	28 88	77%
2	206	[redacted]	33 50	22 69	68%
2	208	[redacted]	33 75	21 26	63%
2	209	[redacted]	36 42	33 43	92%
2	211	[redacted]	33 25	7 62	23%
2	214	[redacted]	37 50	38 16	102%
2	215	[redacted]	37 50	18 65	50%
2	216	[redacted]	30 00	17 40	58%
2	220	[redacted]	38 25	41 22	108%
2	222	[redacted]	30 00	19 62	65%
	Order & Billing		385 17	281 07	73%
	3.28.65			Last Week	80
				4 Week Avg.	78

FIGURE B

FIGURE C

OFFICE PERFORMANCE REPORT

Week Ending 3-28-65

DEPARTMENT	Actual Hours	Standard Hours	%
01 Payroll	219.25	141.57	65
02 Order & Billing	385.17	281.07	73
03 Key Punch	582.90	583.57	100
04 Credit Union	156.59	141.75	91
05 Sales	-	-	-
06 Production Control	120.75	79.87	66
07 TABULATING	74.25	48.31	65
TOTAL	1538.91	1276.11	83
Last Week			85