

DOCUMENT RESUME

ED 094 458

EA 006 304

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TITLE Systems Design and Programing for a Flexible,
Multi-Purpose Feedback System.
PUB DATE Apr 74
NOTE 21p.; Paper presented at American Educational
Research Association Annual Meeting. (59th, Chicago,
Illinois, April 15-19, 1974)

EDRS PRICE MF-\$0.75 HC-\$1.50 PLUS POSTAGE
DESCRIPTORS *Data Processing; *Information Needs; *Information
Systems; *Information Utilization; Reading Programs;
School Districts; *Student Records; Systems
Approach

ABSTRACT

A feedback system for reporting individual pupil variables; classroom, school, and districtwide summaries was designed. The system utilized optically scanned forms which produced input files for report production. The system was designed so that the numbers and types of variables were fixed, but that the content of the variables was completely flexible to meet widely varying needs from district to district. Content labels facilitated interpretation of variables for different grade levels and districts. The system was able to provide a five-working-day turnaround from the day the forms were received by the central office. (Author)

ED 094458

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Systems Design and Programming
for a Flexible, Multi-purpose
Feedback System

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Paper Presented at AERA, April, 1974
Chicago, Illinois
Session 20.22

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ABSTRACT

A "feedback" system for reporting individual pupil variables, classroom, school and district wide summaries was designed. The system utilized optically scanned forms which produced input files for report production. The system was designed so that the numbers and types of variables were fixed but that the content of the variables was completely flexible to meet widely varying needs from district to district. Content labels facilitated interpretation of variables for different grade levels and districts. The system was able to provide five working day turnaround from the day the forms were received by the central office.

Introduction

Our feedback system needed to keep the customer satisfied in three dimensions-not necessarily orthogonal. The first dimension was level of management. The second was the variety of variables to be reported, and the third was Individual District requirements, the School District of Philadelphia being divided into eight sub-districts each having its own requirements. Although the system needed to accommodate any content it was developed in cooperation with the district reading teams.

Market Survey

Our first step was to contact the various levels of managers and survey them as to their data needs for decision making. A conference was held with each District reading team and the systems design staff. The District reading team was able to express the managerial needs for the District Superintendent, supervisors of reading, reading teachers and classroom teachers. Of course, each District felt their particular decisions and the variables needed for them were the most important and must be included in the reports. So, a compromise had to be worked out to provide a mix of reported variables that would include most of the needs expressed. A major consideration in the compromise was the fact that the responsibility for collection of the data lay with the classroom teacher, therefore the reports would need to reflect and regard her efforts in order to make the system viable.

Central office curriculum staff were also interviewed and their needs were input into the compromise.

What did we squeeze out of the Compromise?

Several other constraints were also considered. For, instance, with how many pages of output could a customer cope in reviewing the report he received. It was decided that two pages could contain enough information for a decision maker at the classroom level to have meaningful feedback for each student and to summarize the classroom information too. Thus, each classroom teacher report consisted of two pages for each reading program, one page was a one-line per pupil report and the second a classroom summary.

Principals would receive duplicates of the classroom reports plus summary pages for each program within a grade for his school.

Another constraint was time. We felt that turnaround over one week would begin to age the report information to where it might be useless for decision making especially at the classroom level. So, the data reduction, file manipulation, and report generation had to be efficient enough to work into the existing computer operations schedule.

These compromises and constraints led to the final parameters of the report system.

Variables Manipulated:

Summary Statistics

Eleven nominal variables	Frequencies, Percentages
Two ordinal variables	Frequencies, Percentages, Medians
Eight interval variables	N, Mean, SD

The nominal variables (Yes-No) were used to report services received by the pupil or to indicate certain program conditions. The two ordinal variables reported the Individual Reading Inventory level and the reading program book level. The eight interval variables covered test scores and absenteeism expressed as an interval variable. Each variable was reported for two points in time so that gains and differences could be examined, however, the content of the variables could pertain to any desired.

To accommodate the fact that each of the eight districts and the more than 36 reading programs over 13 grade levels (K to 12) would require that the reported variables be different, a system of header and line labels was worked out so that each district could specify its own report headers and variable labels for each grade level. Further, the computer program was dimensioned to accommodate up to six different reading programs in any one grade.

Each district also custom designed its own data collection form. These were OpScan forms on the first year and are now NCS forms. In either case the various district forms when scanned produced a data record having a common format. In this way the computer program always saw the same input variables regardless of a specific district's content.

Did we keep the customers satisfied?

Well, we hope so, we supplied flexibility across diverse district needs by allowing data collection forms, and report labels and headings to be customized grade by grade and district by district. Thus, even though all the customers were restricted to using the same set of types of variables they were able to plug in their own particular information. We supplied the needs of various management levels by generating reports and summaries meaningful to their particular decision making processes, and we developed a system which could be executed with the existing computer hardware, software and work schedule.

Examples

Figures 1,2, and 3 show Classroom Pupil Report, Classroom Summary Report, and School-Grade Summary Report for the "MULTI-LEVEL WITH OPER. RSC" reading program. Figure 1 contains a line for each pupil showing his or her entries for various variables. A glossary of labels is on the bottom of the form. Figure 2 shows a summary for the same classroom. Figure 1 and 2 constituted the classroom teacher's report.

Figure 3 shows the principal's report for the same reading program summarized over all rooms in his or her school.

District Summary. Figure 4 shows a District Summary for a reading program in grade eight. The top three lines identify the Reading Program (Multi-level), All schools in the district, the eighth grade, All rooms with a pupil total of 4449. The report covers three time points (CKPT-1, CKPT-2, CKPT-3.) One of the two ordinal variables is reported at the top section of the page. The number, percent, and median are reported for Reading Program Book Level for one pupil. The asteriks indicated the median. The levels range from "PPI ORA" in the first column to "27" in the second column. Three data summaries are presented in the center section of the page. The left most displays numbers and percents of the total pupils on each of the eleven nominal indicators. Next to the right is the Absence summary showing the numbers, total percent, and medians for two check points. On the right center is the second ordinal variable display showing number, percents, and medians for only pupils having this information. Note that the median moved from "BOOK5" in CKPT-1 to "BOOK6" in CKPT-3, 2432 pupils were reported at CKPT-1 while only 1968 were reported at CKPT-3.

At the bottom of the page are displayed means, standard deviations, and total pupils reported for six interval variables at two CKPT'S and the differences. Note that while 1815 and 1840 pupils were reported for the "ALPHABETMASTER UC" PRE and POST, means respectively, only 1144 were reported in the difference mean. This difference, calculated by the computer program is not the same as 55 minus 44 as it was calculated from only the pupils having both PRE and POST scores. The other four variables were unlabeled. All values were rounded to the nearest integer and not reported if less than one.

The remaining display in the lower right corner contains something labeled IOWA Reading means, standard deviations for 1970 and 1971, but appears to be two variables expressed on different scales. There is also a district identification masthead in the lower right corner.

Data Collection Form. District Seven designed a two sided NCS form. The green side was for use in grades one through six while the red side was for use in grades seven through twelve. A separate NCS scanning program was written for each side of the form. Header targets were used so that it was not necessary to enter group information on each pupil's form. The form was continuous, that is, the form could be pre-printed with individual pupil identification in the masthead areas. This printing included "slugging" targets for the pupil ID number, school, and grade codes.

System Flow. Figures 6 through 10 show the system flow charts for processing data through the system. Pre-printing (Figure 6) and distributing forms required one to two weeks. Data collection (marking forms) was done by teachers and/or aides. Headers were added and district staff edited the forms before processing on the NCS scanner. Scanning forms, sorting of files, and production of reports could be completed in five working days, so that reports could be returned in one week after the forms were received by the central office.

PUPIL NAME	MOB CSD	-IRI- SULLIVAN END			BOOK PLACEMENT OF BOOK TEST	BOTEL LEVEL A	BOTEL LEVEL B	BOTEL LEVEL I	CAT	NUM READING ABS TEST	
		1	2	3						1	2
	+++	06 06	0	0	0	17	63	0	0	0	0
	+++	06 06	0	0	0	17	63	0	0	0	0
		07 07	0	0	0	16	62	0	0	0	0
		06 07	0	0	02	02	48	0	0	0	0
		06 07	0	0	0	33	05	0	0	0	0
		05 06	0	0	0	51	36	0	0	0	0
		06 07	0	0	0	42	60	0	0	0	0
		06 07	0	0	0	45	50	0	0	0	0
		06 07	0	0	0	04	04	0	0	0	0
		06 07	0	0	0	42	62	0	0	0	0
		05 06	0	0	0	44	58	0	0	0	0
		05 06	0	0	0	40	56	0	0	0	0
		06 07	0	0	0	43	56	0	0	0	0
		06 07	0	0	0	37	62	0	0	0	0
		06 07	0	0	10	46	61	0	0	0	0
		06 07	0	0	0	56	56	0	0	0	0
		06 07	0	0	0	45	58	0	0	0	0
		05 06	0	0	04	40	50	0	0	0	0
		05 06	0	0	0	44	49	0	0	0	0
		06 07	0	0	0	45	55	0	0	0	0
	++	08 08	0	0	0	12	63	0	0	0	0
		04 05	0	0	06	01	61	0	0	0	0
		05 06	0	0	0	40	30	0	0	0	0
		05 06	0	0	0	28	45	0	0	0	0
		05 06	0	0	0	46	59	0	0	0	0
		06 07	0	0	0	46	62	0	0	0	0
		06 07	0	0	10	41	59	0	0	0	0
		06 07	0	0	00	45	53	0	0	0	0

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N-3 IS MOBILITY
 * IS NEW TO CLASS
 * IS NEW TO SCHOOL
 * IS NEW TO DISTRICT

BK IS BOOK
 BC IS BOOKS COMPLETED

CAL. READING TEST
 *V IS VOCABULARY
 *C IS COMPREHENSION
 *I IS TOTAL

PRE-SCHOOL
 *H IS HEAD START *K IS KINDERGARTEN
 *G IS GET SET *C IS CHILD CARE CTR.
 *E IS FOLLOW THRU *O IS OTHER
 *P IS PRIVATE NURSERY

BK	CKPT-1		CKPT-2		CKPT-3		NUMBER
	NO	PCT	MDN	NO	PCT	MDN	
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							

READING PROGRAM BOOK LEVELS	MEAN		S.D.
	NO	PCT	
1			
2			
3			
4			
5			
6			
7			
8			
9			

MOBILITY	ABSSENCE-1-		TOTAL	
	NO	PCT	NO	PCT
3 10 0 IS 0-5 DAYS	21	72***	29	29
3 10 1 IS 5-10 DAYS	4	13		
2 6 2 IS 10-15 DAYS	4	13		
3 15 1.5-20 DAYS				
4 15 20-25 DAYS				
5 15 25-30 DAYS				
6 15 30-35 DAYS				
7 15 35-40 DAYS				
8 15 40-45 DAYS				
9 IS OVER 45 DAYS				

CHECKPOINT-1	BOTEL		BOTEL		NUMBER
	MEAN	S.D.	NO	PCT	
5					
4					
6					
11					
5					
29					

CHECKPOINT-2	BOTEL		BOTEL		NUMBER
	MEAN	S.D.	NO	PCT	
7					
6					
2					
11					
5					
29					

CHANGE
 MEAN 2
 S.D. 2
 NUMBER 8

CHANGE
 MEAN 5
 S.D. 5
 NUMBER 26

INFORMAL READING INVENTORY	CKPT-1		CKPT-2		CKPT-3	
	NO	PCT	MDN	NO	PCT	MDN
01 IS READINESS	1	3				
02 IS PREPRIMER	7	24				
03 IS PRIMER						
04 IS BOOK 1						
05 IS BOOK 2-1						
06 IS BOOK 2-2	19	65***				
07 IS BOOK 3-1	1	3				
08 IS BOOK 3-2	1	3				
09 IS BOOK 4						
10 IS BOOK 5						
11 IS BOOK 6						
12 IS BOOK 7						
13 IS BOOK 8						
14 IS BOOK 9						
15 IS OTHER						
TOTAL PUPILS	29		29		29	

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THE SCHOOL DISTRICT OF PHILADELPHIA
 OFFICE OF RESEARCH AND EVALUATION
 FIELD OPERATIONS RESEARCH
 DISTRICT TWO READING PROGRAM REPORT
 PHILIP D. PITTIS
 JOHN A. FRANGIPANI
 DISTRICT SUPERINTENDENT READING MANAGER
 JAMES E. SCHEID
 JAMES P. CUMERFORD
 DIST. RESEARCH ASSOC. DE6 8100 RES. ASSIST.

CKPT-1 CKPT-2 CKPT-3 CKPT-1 CKPT-2 CKPT-3 CKPT-1 CKPT-2 CKPT-3
 NO PCT MDN NO PCT MDN

BK	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
PPL OR A																		
PPZ OR B																		
C																		
READING 1																		
PROGRAM 2																		
BOOK 3																		
LEVEL 4																		
TOTAL PUPILS 5																		

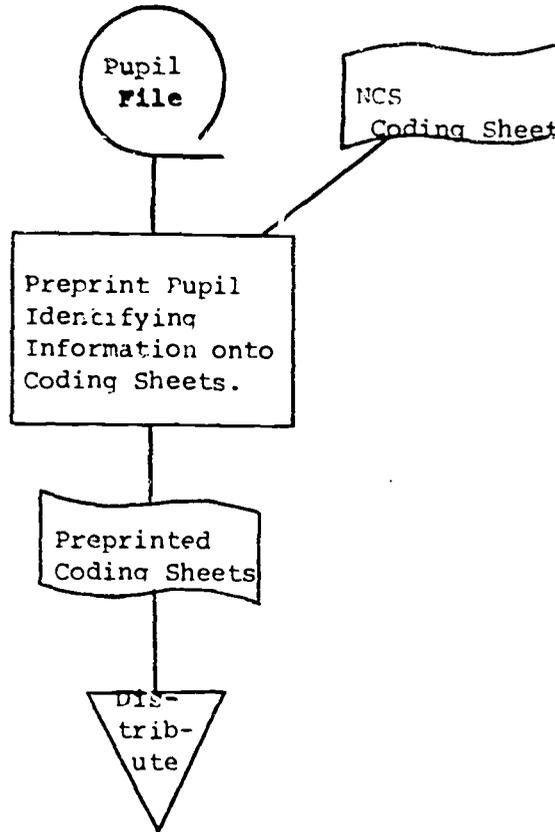
PHONICS MASTERY AND SUPPORTIVE SERVICES

	NO	PCT	ABSENCES CODE	CKPT-1 NO PCT MDN	CKPT-2 NO PCT MDN	CKPT-3 NO PCT MDN	GROUP READING INVENTORY LEVEL CK PT-1 NO PCT MDN	CKPT-2 NO PCT MDN	CKPT-3 NO PCT MDN
INITIAL CONS.	1624	36	0 15 0-5 DAYS	157 30	1061 25	61 15 READINESS	6		
FINAL CONS.	1909	33	1 15 5.9-10 DAYS	716 18	701 16	03 15 PRIMER	18		
BLENDS	1344	30	2 15 10.5-15 DAYS	543 14	539 12	04 15 PRIMER	61	3	46
DIGRAPHS	1358	21	3 15 15.5-20 DAYS	367 9	386 9	05 15 BOOK 1	146	6	34
SHORT VOWELS	615	13	4 15 20.5-25 DAYS	235 6	296 7	06 15 BOOK 2-1	142	5	72
LONG VOWELS	1512	33	5 15 25.5-30 DAYS	185 6	220 5	07 15 BOOK 2-2	122	5	109
OTHER WORDS	1361	30	6 15 30.5-35 DAYS	124 3	193 6	08 15 BOOK 3-1	109	4	95
READING SPECS.	1134	25	7 15 35.5-40 DAYS	96 2	132 3	09 15 BOOK 3-2	142	5	120
AIDE OR TUTOR	606	13	8 15 40.5-45 DAYS	74 1	116 2	10 15 BOOK 4	246	10	164
READ. CENTER	482	10	9 15 45+ DAYS	319 8	560 13	11 15 BOOK 5	276	12	256
						12 15 BOOK 6	351 14	14	342
						13 15 BOOK 7	291 10	10	269
						14 15 BOOK 8	306 12	12	287
						15 15 BOOK 9	82 3	3	195
						TOTAL PUPILS	1432	2	

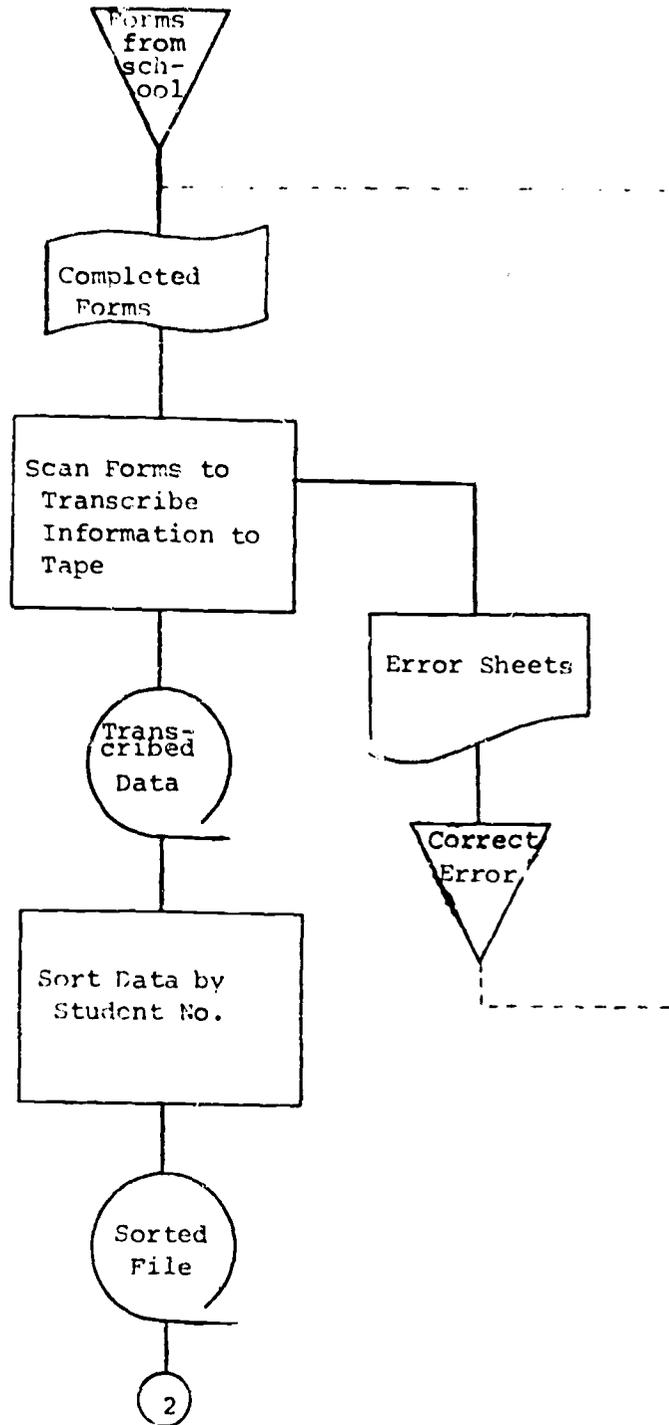
ALPHABET MASTERY UC PRE MEAN 44 19 17 52 MEAN 288 41
 PRE S.O. 18 10 19 17 S.O. 149 13
 TOTAL PUPILS 1815 1661 2715 2780 TOTAL PUPILS 442 103
 POST MEAN 55 23 10 5 THE SCHOOL DISTRICT OF PHILADELPHIA
 POST S.O. 11 9 5 OFFICE OF RESEARCH AND EVALUATION
 TOTAL PUPILS 1840 1582 1583 FIELD OPERATIONS RESEARCH
 DISTRICT SUPERINTENDENT
 DR. THOMAS K. MINTER
 DISTRICT RESEARCH ASSOCIATE
 ARNOLD ESCOURT
 JE-5-3531

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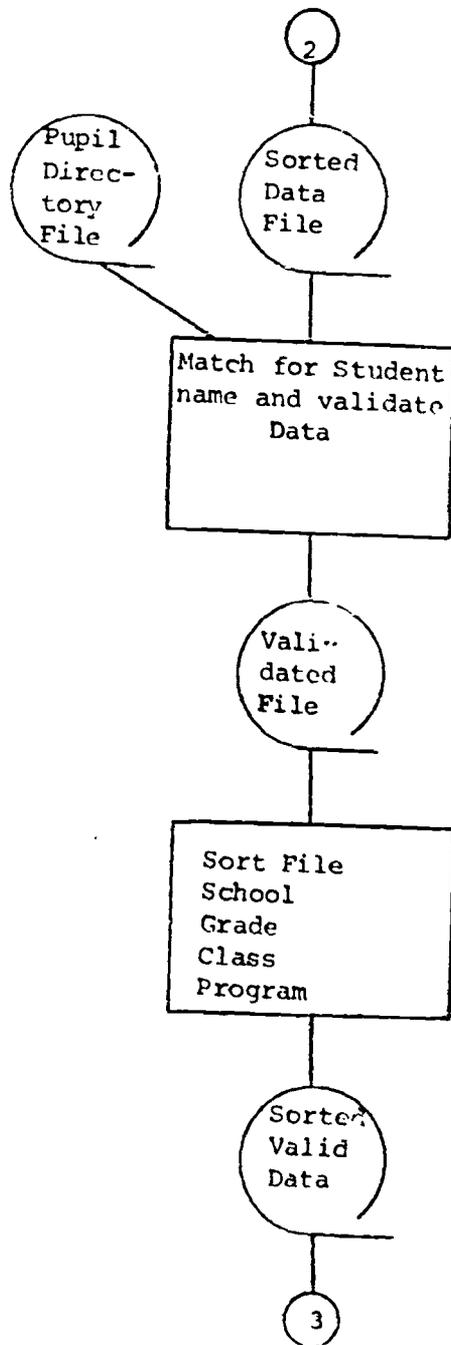
Office of Research and Evaluation
Multi-Task System
Phase I Form Preparation



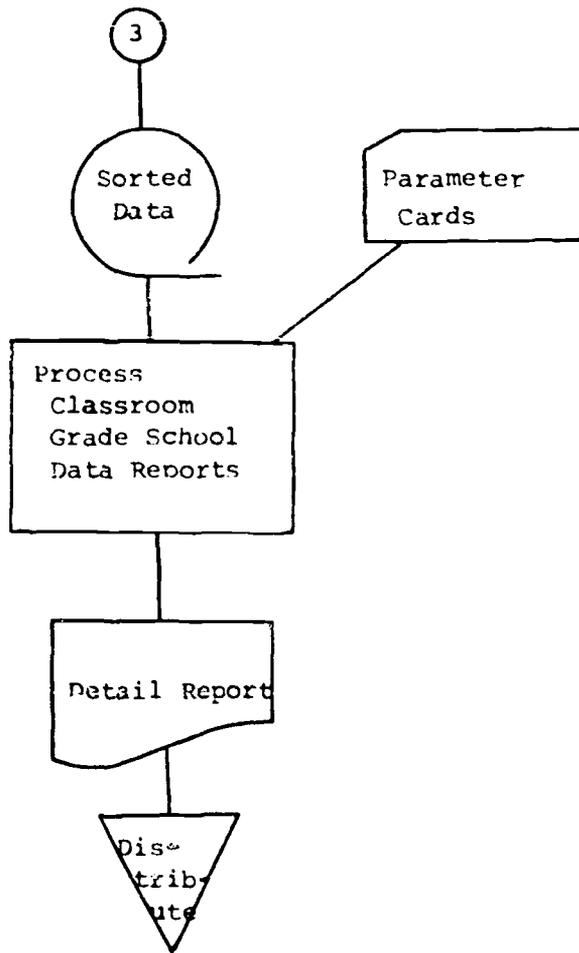
Office of Research and Evaluation
Multi Process System
Input Processing



Input Processing-Continued



Input Processing - Continued



Input Processing-Continued

