

THE NEED FOR "MANUAL TECHNOLOGY"

*by Rosalinda P. Bautista**

Education Minister Onofre D. Corpuz in his address to the first micro computer exposition at Manila Garden Hotel said "the merging of human intelligence and the best of computer technology can invariably result in enormous improvement in our lives". I do not wish to refute the statement of Minister Corpuz but I guess you will agree with me that one can not always depend on computerized processing to come out with timely statistics.

To a statistical agency like the National Census and Statistics Office, nothing can be more important than the timely release of accurate statistics. At the moment, NCSO can boast only of its very few timely statistics, the most popular of which are the foreign and domestic trade statistics and consumer price indices. It is not that the NCSO computer is not powerful enough to handle all the data processing requirements. In fact, the IBM 4341 system which the NCSO has is more than enough for the processing of censuses, surveys and special projects. However, the agency is not an exception when it comes to data processing problems. While there could be an operational data processing system, unless efficient no one can guarantee that outputs could be generated before the next survey results are in. In addition, brownouts and machine breakdowns which are beyond one's control can cause delay in the entire processing system. When statistics can not be produced on time from the computer or when one doesn't have the computer to do it, "manual technology" is an alternative to consider.

WHAT IS "MANUAL TECHNOLOGY"

The so-called "manual technology" as recently implemented in

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our Field Offices including the Central Office for the Integrated Survey of Households, is a procedure in which coded entries in the survey schedules are transcribed into a card. Then, these cards are batched and sorted following some instructions to generate the required statistical tables.

The idea was brought to us by Mr. Laurie Lewis, ESCAP Demographic Adviser when he came over to assist in the evaluation of the 1980 Census of Population and Housing. The same ideas was witnessed in Japan by our Executive Director. The Japanese resorted to "manual technology" in the processing of their census of population. However, that was after machine tabulations were already completed and there was a need for other tabulations.

MECHANICS OF "MANUAL TECHNOLOGY"

The mechanics of manual technology are very similar to that of computerized processing except that human beings are used to compute, store and sort entries. There are three basic requirements for the use of manual technology. First, is the design of the card (input) and the description of the card contents (File Description). Second is the format of the tables to be generated. And lastly, the batching and sorting instructions including the design of the batch compilation sheet.

DESIGNING THE CARD

The handtally card is composed of several rows and columns forming a number of cells or positions. (See attachment1). The card should be designed so as to capture all the entries in the survey schedule. Although not all the variables may be required in the tabulations, it is essential that consecutive entries be picked-up and not be selective in the transcription as this could cause error due to wrong pick-up of entries.

Each cell may be entered a one-digit or alphabetic entry. For example, the value for AGE is usually coded using 2 digits and therefore AGE will occupy two positions such as positions 21-22 in the

ISH handtally card (See attachment2). The age of the person is 29. In an exceptional case, 3 digit entries could be entered in two cells only. However, the dividing bar is removed for easy identification. Positions 59-60 (Total days worked for the Primary Job during the Quarter) is an example.

Simultaneous with the designing of the card is the description of the card contents (See attachment 3). The File Description is necessary to keep track of the coded entries in the card.

PREPARATION OF THE BATCH/SORT INSTRUCTIONS

Before the batch/sort instructions can be prepared, a review of the tables to be generated is necessary. Some tables could have common classifications such as urban-rural breakdown or by sex. If so, it can be helpful to pre-sort the cards according to these variables (See attachment 4).

It is all right to prepare a set of instructions for every table but it is also possible to combine these instructions and generate all the tables at the same time. It is usually convenient to sort a batch of about 300 to 500 cards. Sort instructions which usually follow the table format, gives the location by which sorting is to be done and the expected entries in that position. (See attachment 5).

ADVANTAGES AND LIMITATIONS OF MANUAL TECHNOLOGY

The major advantage of manual technology when compared to machine processed data is shorter or minimized data cleaning period, and hence, the timely release of the outputs. Manual technology provides a method by which inconsistent entries could be easily detected during the sorting. Since the storage medium is not magnetic tapes or disk, updating could be done very easily.

Another major advantage is that manual technology can be implemented in the NCSO Field Offices and hence, they are able to produce whatever tabulations maybe needed by them. This is a lot cheaper than the installation of a microcomputer at the Regional Offices for processing of provincial data.

In addition, when all survey schedules have been 'carded', less space is needed to store the cards than the questionnaires.

Despite its advantages, manual technology has its limitations, too. The monotony of transcription or coding can cause boredom and loss of interest in the work. Hence, statisticians are not expected to do continuous coding and sorting, otherwise their intelligence could be depleted. In addition, the handtally cards when not kept intact could easily get lost.

HOW TO DO MANUAL TECHNOLOGY.

Below is a 7-step procedure in conducting manual technology.

1) Simultaneously edit and transcribe the codes from the schedule into the card.

2) Make a general review of the cards by ocular inspection of entries and checking for inconsistencies.

3) Post the raising or weighting factor in every card.

4) Batch the cards when necessary, otherwise proceed to sort instructions.

5) Always count the number of cards at the start of the sort instruction to ensure that the cards are complete.

6) The weights to be entered in the batch compilation sheet is the sum of the weights or raising factor of all cards having the same code for a particular position.

7) Summarize the batch compilation sheets to generate the required statistical tables.

It is necessary to know the actual time it takes to do one activity and the quantity accomplished in order to establish work standards. When these are known, more realistic timetable could be set.

CONCLUSION

As a closing remark, I wish to inform you that manual technology is not totally replacing our computerized processing as far as the Integrated Survey of Households is concerned.

Manual technology is our way of providing users more advanced preliminary tabulations on labor force characteristics while waiting for the final tabulations from the computer.

ATTACHMENT 1

INDIVIDUAL MEMBER CARD

ISH _____ BARANGAY _____

	1	2	3	4	5	6	7	8	9	0
1-10										
11-20										
21-30										
31-40	P									
41-50										
51-60										
61-70	O									
71-80										
81-90										
91-100										
101-110										
111-120										

RAISING FACTOR _____

ATTACHMENT 2

INDIVIDUAL MEMBER CARD

ISH

BARANGAY 839

	1	2	3	4	5	6	7	8	9	0
1-10	3	9	1	2	0	0	7	-	1	5
11-20	0	1	4	1	1	0	1	0	1	M
21-30	2	9	2	3	1	9	6	6	1	1
31-40	0	9	6	5	7	1	9	1	1	2 3
41-50	0	3	0	6	2	4	-	-	-	-
51-60	2	3	0	2	0	5	0	8	74	
61-70	0									
71-80										
81-90										
91-100	0	3	2	0	0	2				
101-110										
111-120	1	4	8	-	-	0	1	6	5	0

RAISING FACTOR 401.60

NEED FOR MANUAL TECHNOLOGY

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NATIONAL CENSUS AND STATISTICS OFFICE
HOUSEHOLD SURVEYS DIVISION

ATTACHMENT 3

FILE DESCRIPTION

Sheet 1 of 4

Application: <u>INTEGRATED SURVEY OF HOUSEHOLDS</u>						
Prepared by: <u>Household Surveys Division Staff</u>				Date Prepared: <u>April, 1983</u>		
Card Position	Field Length	Standard Name of Variable	Item Number	Relevant Description of Field	Data Format	Expected Entry
1 - 15	15	HHLD		HOUSEHOLD IDENTIFICATION		
1 - 2	2			Province		01 - 77
3 - 4	2			Municipality		
5 - 8	4			Barangay		
9	1			Urbanity		1, 2
10	1			Barangay Stratum		1 - 6
11 - 13	3			Household Serial No.		
14	1			Household Stratum		1, 2
15	1			Household Schedule No.		
				DATA ON INDIVIDUALS		
16 - 17	2			Line Number (Member ID)		
18 - 19	2			Relationship to Head		01 - 13
20	1			Sex		M, F
21 - 22	2			Age		
23	1			Marital Status		1 - 5
24 - 25	2			Highest Grade Completed		
26 - 28	3			Usual Occupation		
29	1			Employment Indicator		
30	1			Days Worked Indicator		
REMARKS:						

NATIONAL CENSUS AND STATISTICS OFFICE
HOUSEHOLD SURVEYS DIVISION

FILE DESCRIPTION

Sheet 4 of 4

Application: <u>INTEGRATED SURVEY OF HOUSEHOLDS</u>						
Prepared by: <u>Household Surveys Division Staff</u>					Date Prepared: <u>April, 1983</u>	
Card Position	Field Length	Standard Name of Variable	Item Number	Relevant Description of Field	Data Format	Expected Entry
91 - 95	5			Salary/Wage/Net Receipts In Cash and In Kind		
96	1			Wanting More Work		
97 - 110				UNEMPLOYMENT CHARACTERISTICS		
97	1			Did he want to work at anytime during the past quarter?		
98 - 100	3			Occupation Wanted		
101	1			Did he look for work at anytime during the past quarter?		
102	1			Why did he not look for work?		
103	1			Has he ever worked since age 15?		
104 - 106	2			Occupation Engaged In		
107 - 109	3			Kind of Business Engaged In		
110	1			Class of Worker		
111 - 115				PAST WEEK ACTIVITY		
111	1			Did he work last week?		
112 - 113	2			How many hours did he work?		
114	1			Did he look for Full/Part time work?		
115	1			Why did he not look for work?		
116 - 120	5			Sum of all Receipts From Other Sources In Cash and In Kind		
REMARKS:						

NEED FOR MANUAL TECHNOLOGY

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NATIONAL CENSUS AND STATISTICS OFFICE
HOUSEHOLD SURVEYS DIVISION

FILE DESCRIPTION

Sheet 3 of 4

Application: <u>INTEGRATED SURVEY OF HOUSEHOLDS</u>						
Prepared by: <u>Household Surveys Division Staff</u>					Date Prepared: <u>April, 1983</u>	
Card Position	Field Length	Standard Name of Variable	Item Number	Relevant Description of Field	Data Format	Expected Entry
61 - 90				SECONDARY OCCUPATION		
61 - 63	3			Occupation		
64 - 66	3			Kind of Business		
67	1			Class of Worker		
68	1			Job Status		
				Number of Days Worked		
				1st Month		
69 - 70	2			Full Days		
71 - 72	2			Less Than Full Days		
73 - 74	2			Ave. Hrs. Worked/Less		
				Than Full Day		
				2nd Month		
75 - 76	2			Full Days		
77 - 78	2			Less Than Full Days		
79 - 80	2			Ave. Hrs. Worked/Less		
				Than Full Day		
				3rd Month		
81 - 82	2			Full Days		
83 - 84	2			Less Than Full Days		
85 - 86	2			Ave. Hrs. Worked/Less		
				Than Full Day		
87 - 88	2			Normal No. of Hours Worked		
89 - 90	2			Total No. of Days Worked		

R. P. BAUTISTA

NATIONAL CENSUS AND STATISTICS OFFICE
HOUSEHOLD SURVEYS DIVISIONFILE DESCRIPTIONSheet 2 of 4

Application: <u>INTEGRATED SURVEY OF HOUSEHOLDS</u>						
Prepared by: <u>Household Surveys Division Staff</u>					Date Prepared: <u>April, 1983</u>	
Card Position	Field Length	Standard Name of Variable	Item Number	Relevant Description of Field	Data Format	Expected Entry
31 - 60				PRIMARY OCCUPATION		
31 - 33	3			Occupation		
34 - 36	3			Kind of Business		
37	1			Class of Worker		1 - 6
38	1			Job Status		1 - 3
				Number of Days Worked		
				1st Month		
39 - 40	2			Full Days		
41 - 42	2			Less than Full Days		
43 - 44	2			Ave. Hrs. Worked/Less		
				than Full Day		
				2nd Month		
45 - 46	2			Full Days		
47 - 48	2			Less than Full Days		
49 - 50	2			Ave. Hrs. Worked/Less		
				than Full Day		
				3rd - th		
51 - 52	2			Full Days		
53 - 54	2			Less than Full Days		
55 - 56	2			Ave. Hrs. Worked/Less		
				than Full Day		
57 - 58	2			Normal No. of Hours Worked		
59 - 60	2			Total No. of Days Worked		

BATCH INSTRUCTIONS

ATTACHMENT 4

Sort on Position 21-22(Age)

	15	15 & over	Total
# of cards			
weight			

Sort all '15 & over' on Position 9(Urban/Rural)

	1	2	Total
# of cards			
weight			

Sort all '1' on Position 20(Sex)

	M	F	Total
# of cards			
weight			

Sort all '2' on Position 20(Sex)

	M	F	Total
# of cards			
weight			

Batch 3

Batch 4

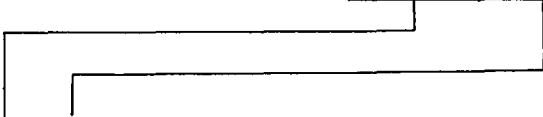
SORT INSTRUCTIONS FOR EVERY BATCH

ATTACHMENT 5

Position Position
 9 20
 (Urban/Rural) (Sex)

Sort batch on Position 29(Employment Indicator)

	1	2	Total
# of cards			
weight			

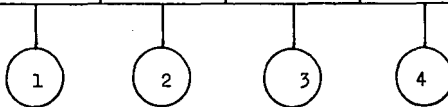


Sort all '2' on Position 97, 101 and 102(Unemployed/Not In Labor Force)

	Position	Codes	# of cards	weight	Total
Unemployed	101	1			
	102	4, 5, 7			
Not In the Labor Force	97	3			
	102	1, 2, 3, 6			

Sort all '1' on Position 37(Class of Worker)

	1, 2, 5	3, 4	6	Blank	Total
# of cards					
weight					



ATTACHMENT 5

HOUSEHOLD POPULATION 15 YEARS OLD AND OVER BY EMPLOYMENT STATUS,
BY SEX, BY INDUSTRY, BY PROVINCE, URBAN AND RURAL:

_____ QUARTER 1983

EMPLOYMENT STATUS AND SEX	TOTAL	URBAN	RURAL
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PROVINCE OF _____

TOTAL 15 YEARS OLD AND OVER:

MALE

FEMALE

IN THE LABOR FORCE:

MALE

FEMALE

EMPLOYED

IN AGRICULTURE:

MALE

FEMALE

IN NON-AGRICULTURE:

MALE

FEMALE

UNEMPLOYED

MALE

FEMALE

NOT IN THE LABOR FORCE:

MALE

FEMALE

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EMPLOYED PERSONS BY CLASS OF WORKER AND
INDUSTRY BY PROVINCE, URBAN-RURAL
QUARTER 1983

I N D U S T R Y	Total	Wage and Salary Workers	Own Account Workers	Unpaid Family Workers	Not Stated
TOTAL					
Agriculture, Fishery & Forestry					
Mining & Quarrying					
Manufacturing					
Electricity, Gas and Water					
Construction					
Wholesale & Retail Trade					
Transportation, Storage & Communication					
Financing, Insurance, Real Estate and Business Services					
Community, Social & Personal Services					
Industry Not Adequately Defined					
URBAN					
(Same as above)					
RURAL					

NEED FOR MANUAL TECHNOLOGY

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EMPLOYED PERSONS BY CLASS OF WORKER AND
INDUSTRY BY PROVINCE, URBAN-RURAL

QUARTER 1983

I N D U S T R Y	Total	Wage and Salary Workers	Own Account Workers	Unpaid Family Workers	Not Stated
TOTAL					
Agriculture, Fishery & Forestry					
Mining & Quarrying					
Manufacturing					
Electricity, Gas and Water					
Construction					
Wholesale & Retail Trade					
Transportation, Storage & Communication					
Financing, Insurance, Real Estate and Business Services					
Community, Social & Personal Services					
Industry Not Adequately Defined					
URBAN					
(Same as above)					
RURAL					