

# **INFORMATION TECHNOLOGY OPTIONS FOR THE PHILIPPINES 2000 CENSUS\***

By

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## **INTRODUCTION**

Every census undertaking has always been a challenge to the organization mandated to carry out the task. The wide-scale nature of a census requires huge number of enumerators and supervisors, extensive and several levels of training, good operational and contingency plans, proper supervision and controls, effective processing strategies, and many other aspects. There is really quite a number of concerns to focus on to ensure that the census operation is carried out properly and that the results come out accurately and on time.

The present environment also provides additional challenges to the census organization. Legislators tend to allocate smaller budgets than what is needed. Most often than not, the organization has to redo its plans because of the wide disparity of what is allotted compared to the proposed amount. Census 2000 will not be an exception. In fact, with the recent Asian financial crisis, census organizations are already preparing for further budget cuts. Of course, there is also the continuing user expectations and demands on quality, timeliness, lower level of details, as well as on the mode and manner of access to the census results.

Advances in Information Technology (IT) have been of much help in addressing the challenges. In almost all aspects of the census operations from the planning phase to the final dissemination, one can see the extensive use of computers to produce the necessary outputs. Computers have become affordable even to the smallest organization. Census organizations are therefore expected to exploit IT to carry out its mandates.

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This paper discusses some of the initial plans of the National Statistics Office (NSO) for the Census 2000 in the Philippines. The discussion is limited to IT-related aspects of the project. As much as possible, a background on the past censuses is provided to give the reader a clearer understanding on what is new in the Census 2000.

## **MANAGEMENT OF THE CENSUS OPERATIONS**

An extensive operation such as a census requires good communications between the central and the field offices. Regular status reports as well as exception reports on significant events that happen in the field are essential for monitoring and decision-making. All these reports usually converge at the central office. When consolidated and summarized, they provide an overall picture of the census field operations.

The Philippines consists of many islands. Communications between the central and field offices is crucial in managing the entire operation. For the Census 2000, the Internet is being targeted as the primary medium of communication and transmission of information between the head office and the field. Although telephone lines for dial-up connection are now available in most parts of the country, the presence of Internet Service Providers (ISP) in several provinces will still be expected. At present, 14 out of 15 NSO regional offices have dial-up accounts with local ISPs. At the lower geographic level (provincial), there are now at least 23 field offices with similar access. Given that the census is about 20 months from now and with growing popularity of the Internet, it is projected that all the 85 provincial offices would have Internet access by the time the census is started. In case some of the provinces can not be covered by local ISPs, the option of having long distance toll connections as done in the 1995 round will be considered.

A computerized QuickCount System, designed to provide preliminary and advanced figures on the actual enumeration work, has been implemented in past censuses, specifically during the 1990 and 1995 rounds. The figures are inputted in the provincial offices and sent to the central office on a regular basis during the census duration. In the 1995 operations, the transmission of the Quick Count data has been done through the NSOnet, a Wide-Area Network using long distance dial-up links. To minimize on the communication costs for the Census 2000, the transmission scheme would now utilize the Internet.

The Quick Count figures from all provinces arriving regularly at the Central Office provide a good sense of the overall progress of the field work. However, in the past, there has been difficulties in tracking the progress of specific areas at the lower geographic levels. Barangay (village) maps were used to portray the status of enumeration but the constant updating being done on the paper maps was cumbersome. There is therefore some delay before the actual situation is assessed. To address the updating difficulties, the NSO has laid out plans for having a GIS-based tracking and monitoring system for the field operations. The manual system of updating the hardcopy maps that portray status information will be converted into a GIS application. This application is also tied up to the Quick Count System as the latter provides the inputs on the status of enumeration.

#### **DATA PROCESSING SETUP**

After successful implementation of PC-based data processing of some household surveys in the 80's, the NSO embarked on the use of microcomputers in census processing during the 1990 round. It was in that round when the Philippines got the distinction of being the first country with population of at least 60 million whose census was processed entirely with microcomputers. Using purely PCs for the census was repeated in 1995 and became another processing success. From these experiences and considering the continuous decrease in microcomputer costs, Census 2000 will again be processed with PCs. The use of Handheld PCs during the data collection stage will also be tried. This is described in the next section.

Diskettes were the primary storage media for the records keyed during the 1990 census processing. Due to frequent handling, and more importantly because of the recurring power outages in the Philippines at that time, the diskettes were prone to data retrieval problems. As a result, several batches of questionnaires were re-keyed. This problem was avoided during the 1995 round. For this round, the Office implemented a Local Area Network (LAN) of its computers. This setup also resulted in better security in the access of the census data. From the learnings derived from these census rounds, it was planned that Census 2000 will be using again a LAN infrastructure.

Processing centers were established at the regional level during the 1990 census. In the 1995 round, census processing centers were again set up at the regional level but additional centers were also established in two provincial offices known to have large-volume workload. The two processing centers at the provinces were intended as a pilot to see the feasibility of pushing down further the level of decentralization. There is strong indication that decentralization can be extended to a lower geographic level. Unfortunately, it can not be carried out in a wider scale during the Census 2000 because of funding constraints. Initial plans call for an additional two processing centers in the provinces. Thus, a total of four provincial offices will have a major role in the processing operations. These provinces will be complementing the processing centers that will be established at the regional level.

#### **DATA COLLECTION AND CAPTURE**

Past censuses in the Philippines were all administered using paper-based questionnaire. Data capture from the questionnaires has been done through the usual keying method. For the Census 2000, the same approaches are likely to be repeated, with a few innovations in mind. Among these innovations is the possible use of Handheld Personal Computers (HPC) during the enumeration. It is the thinking that the investments to be made in printed questionnaires may be substantial considering the cost of printing, the shipment and handling, as well as the storage requirements. Probably some amount can be invested in HPCs.

Compared to paper, the HPC units are compact, can be reprogrammed, and can be reused for other data collection activities such as the surveys. It may also be more environment-friendly (unlike the paper questionnaire for which trees have to be cut down to produce the paper).

The NSO experience on HPCs in actual field operations has provided the impetus to its possible application in the Census 2000. Some 250 HPC units were used during the initial round of the 1998 Annual Poverty Indicator Survey (APIS) covering selected areas in the Philippines. Feedback from the field offices concerning suitability of these units for data collection and capture were generally positive. A few aspects, such as the font size in the question text, were also pointed out as needing improvement. However, the identified deficiencies are correctable through programming. Thus, an additional 500 HPC units are

being procured for deployment during the nationwide operations of the APIS this last quarter of 1998.

>From the initial APIS experience, it was concluded that HPC units are potentially useful in wide-scale data collection and capture. But given the financial constraints being foreseen in the next census, it may not be realistic to have the entire census enumeration workforce equipped with HPC units. As a result, plans are being geared towards the use of HPC units in some areas of the country only. To have a better return on investment, it is also important to be able to reuse the units for the other regular surveys of the NSO. Having an oversupply of the units after the census will also have to be avoided. With these considerations, it is therefore unlikely that all enumerators will be equipped with HPCs. A combination of paper-based questionnaires and HPCs would be more realistic.

Traditionally, census data collection in the Philippines is done through the interview method. But there have been some difficulties in obtaining data from a few target groups in the population. These groups include mostly those living in exclusive villages as well as the high-income categories. To have a better coverage in these special groups, a Self-Administered Questionnaire (SAQ) has been designed. SAQs were employed in past two census rounds. This approach will again be adopted for the Census 2000. But aside from the paper-based SAQ, a web-based version will also be developed. It was noted that Internet usage in the Philippines has been increasing and that there is also a growing segment of the population that have access to the Internet. This SAQ-on-the-Internet is considered as another innovation for the Census 2000.

## **DATA DISSEMINATION**

In the past several years, data dissemination has diversified into several forms. Aside from the traditional printed publications, electronic means of dissemination has gain prominence. CD-ROMs and other computer media such as diskettes and other removable storage cartridges were increasingly used to carry not only tabulated results but also micro-level census data. Websites also proved to be effective in reaching worldwide data users and audiences.

For the Philippines, the printed form would remain as the standard medium for dissemination the results of Census 2000. Printed publications will

be supplemented by electronic data products. Such products will include Public-Use-Files (PUF) in CD-ROMs. The PUF contains the raw census data with the some data items deleted to prevent identification of individuals or household in compliance with the confidentiality provisions. Such PUFs will not be limited to CD-ROMs only but will also be produced in other computer media depending on prior arrangements with the client. Similar to the past two censuses, the PUF data package to be developed will also bundle a tabulation software and the data definitions to allow users to generate their own statistical tables.

Electronic or multimedia editions of publications have not been produced at the NSO. But there is now an initiative to try and develop one even on an experimental basis. Hopefully, the experience gained from this current move will eventually lead the NSO in launching a multimedia version of the Census 2000 results.

One by-product of the census that seems to attract more and more research organizations is the maps. There is an apparent lack or limited source of lower-level geographic maps outside of the NSO. The requests serviced by the Office involved mostly the provision of hardcopies of maps. The provision of map copies has been done through photocopying. Since the NSO has already completed the digitization of its previous census maps, it is now moving towards servicing the requests from the digitized maps. The Office is also positioning itself towards developing GIS-based data products from the Census 2000.

A powerful dissemination medium that can not be ignored is the web. The NSO established its website ([www.census.gov.ph](http://www.census.gov.ph)) last year and although far from complete, there has been continuous updating especially in posting data releases. It is expected that the website will continue to be a major dissemination point not only for the census results but also for general information about the undertaking. It was also discussed earlier that web-based SAQ will also be implemented and the same website is being targeted.

Census results on the website will include static web pages for statistical tables and graphs as well as user-specified tabulations. The latter tabulation is done with the user choosing the variables to be tabulated based on a list of data items. The selection of variables is done through the web. Then, the selected data variables are dynamically-generated by the NSO server from the raw data. The results are again presented as web pages to the user.

The dynamic generation of tabulations through the web implies that the entire census data set is continuously held online. This also means tying up storage space for the data. Given that computing power and hard disk storage are continuously increasing while practically maintaining the same costs, it becomes obvious that this server-based dynamic generation of user-specified tabulations is practical enough.

## **CONCLUSION**

The preparation of plans and strategies for the Philippines Census 2000 is heavily influenced by NSO experiences in the past censuses as well as the available technology. Some of the IT-related aspects of the census undertaking were presented in this paper. There is much uncertainty at this point concerning the budget levels for the Census 2000, although getting a higher one at real levels from the Congress will be challenging. It may therefore still be possible that the plans as discussed will be adjusted or scaled down.

Financial and technical assistance from international funding agencies is another avenue that can be explored to address the uncertainty. The decentralization of census processing in the 1990 round was made possible with help from the USAID. The UNFPA has also been assisting the NSO, especially in the dissemination of 1995 census results and in the further use of these in population projections and in coming up with profiles of provinces to support local population development planning, all enabled and facilitated by the use of IT.

Nevertheless, even with the ever-pressing financial and other constraints, the increased use of IT in the overall census operations will still remain imperative in the conduct of the Year 2000 round.