

Development and Challenges of the Mobile-Based Population and Housing Census Mapping System

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Abstracts

Statistics Korea strives to address modern challenges in census environments including deteriorating survey environments and demands for efficient survey taking. The technological advances, particularly in the use of tablet PC equipped with GPS for data collection, are extremely important for the adequate planning of the 2015 Population Census. KOSTAT has a plan to utilize GPS/GIS technology in pilot surveys in 2012 & 2013, pre-survey in 2014, and the 2015 census in order to reduce survey expenses and improve efficiency. This paper will discuss the issues and challenges of the mobile-based census mapping system of population and housing census.

Key Words: CAPI, Census mapping system, Data collection, GIS, GPS, Mobile

1. Introduction

Like other National Statistical Offices, Statistics Korea strives to address modern challenges in census environments including; deteriorating survey environments and demands for efficient survey taking. As a response to international trends in survey collection management, there is an increasing need to shift from traditional survey methods into a new paradigm of survey collection.

Some of the factors that influence change in the survey environment include an increased difficulty in conducting field interviews due to deteriorating survey environments, and increase in population and housing census costs, a surplus in administrative data for population and housing census, advances in information and communication technology (ICT) and an international trend in adopting new survey methodology through more advanced technologies.

This paper will discuss the issues and challenges of the mobile-based census mapping system of population and housing census.

2. Development of the Mobile-Based Census Mapping System

The most common uses of GPS/GIS technology in censuses include the demarcation of enumeration areas, development of maps, and monitoring of census field operations. Other common uses of GPS include location of important geographic features, such as landmarks, hospitals, schools, and settlements. Furthermore, GIS is used to more effectively disseminate census results. According to the report of the UNSD, for all regions, 102 of the 138 countries, representing about 74% of the responding countries reported employing GPS/GIS technology.

Because maps can more effectively deliver spatial relations, we are able to assign specific residences to enumeration districts (EDs) and reclassify EDs as an independent unit for data collection. This has been a fundamental part of census work. ED maps are able to identify clear boundaries between EDs, and have been critical in censuses acquisition.

A Map shows the overall location for the domiciles of survey subjects within the enumerator's assigned ED as well as geographic features such as roads and streams so enumerators can determine a more efficient order of visit and path for interviewing subjects at their domicile as a part of survey planning. By looking at the map, the enumerator is better equipped to find the most efficient way through their ED. Survey efficiency can be ensured by checking on domiciles beforehand, and by checking off domiciles already surveyed to ensure duplicates and omissions of domiciles are avoided, ensuring the workloads for each enumerator is appropriately allocated.

Statistics Korea has a plan to utilize GPS/GIS technology in pilot surveys in 2012 & 2013, pre-survey in 2014, and the 2015 census in order to reduce survey expenses and improve efficiency. The survey management system can check the progress and content by monitoring the status in real time and protect personal information by transmitting responses on mobile devices. The mobile-based census mapping system will save the cost of printing maps and entering data via mobile-based surveys. The time taken to enter data, travel time to survey sites, field survey taking time are all reduced as respondents directly enter responses. Additionally, there will be a smaller margin of error as there no need to calculate the margin for misplaced paper-based

questionnaires. Sample survey ratio for the 2015 population and housing census will be 20% and we will collect the census information on tablet PCs.

Data collection will be carried out using tablet PCs in a face to face interview. (CAPI) Concurrent with the interview, the enumeration area map for statistical purposes will be simultaneously updated. The major features include searching survey subjects, searching and correcting census maps, questionnaire data entry and management and field survey management. The mobile-based population and housing census environment is provided by linking existing population and housing census system through a 3G communication environment and mobile devices (Galaxy Tab 10.1).

3. Conclusion

Statistics Korea technical staff are responsible for the development the Information and Communication Technology (ICT) for the 2015 Census. The tablet PC system runs to collect and store the information. Each tablet PC is equipped with a Enumeration Area Map; list of addresses developed during pre-census operation (for the EA that this operation is done); list of collective living quarters; short and long form questionnaires; GPS; and summary information collected to facilitate monitoring enumerator's work. The technological advances, particularly in the use of tablet PC equipped with GPS for data collection, are extremely important for the adequate planning of the 2015 Population Census.

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