Mobile data collection application for Time use survey 2019 of Mongolia

Myagmarsuren Lkhagva
myagmarsuren@nso.mn
National Statistics Office
Ulaanbaatar, Mongolia

Abstract:
There is an increasing demand on data, and it creates a big burden on data producers and respondents. Recent observations show that respondents do not prefer providing data by using current survey methodologies such as PAPI, CAPI, CATI, CAWI due to the time requirements. This has led data producers to consider other approaches to gather information from the respondents to produce reliable, timely and complete data. Over the last decade, much progress has been made in using new technologies such as mobile application surveys for smartphones.

From the perspective of data producers, particularly National Statistical Offices, mobile application surveys are an effective way of data collection to increase the response rate as well as reducing time and budget spent on data collection, processing and dissemination.

The National Statistical Office of Mongolia developed its first mobile application for Time Use Survey 2019 which consisted of two sections, household questionnaires and a diary. NSO of Mongolia conducted a pilot study to compare the data collection process of PAPI and mobile application. The results show that, in the use of PAPI the interviewer plays a key role as she visits the household on multiple occasions over the survey period and this leads to many issues including unit non-response and item non-response. When using the mobile application, the need for regular visits by the surveyor was eliminated. Furthermore, the mobile application made it easier to collect, code, and enter data. Respondents have the ability to fill a diary with the app when they are in the public transportation, waiting at a restaurant or relaxing. All data that is filled by the respondent is delivered to central server, allowing NSO staff to send out comments to the respondents once the data is entered. The use of the mobile application saved time for both the interviewer and the respondent.

This study provides an overview of the knowledge, experiences and future plans on NSO Mongolia in the area of new data collection solutions and validation methods for mobile applications surveys.

Keywords: Modern method of data collection an analysis, reduce respondent burden, field monitoring

1. Introduction:

Time use surveys (TUS) are important to produce indicators about how individuals spend their time on different activities, on a daily or weekly basis. Indicators that can be derived from TUS include amount of time spent on housework by gender, amount of time spent at work by age help in monitoring the progress towards achievement of the 2030 Sustainable Development Agenda, particularly on Gender Equality, indicator 5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location.

Supported by UNDP, Mongolia conducted its first time-use survey (a pilot) in 2000 using a 24-hour self-reported time diary. The objectives of the survey were:

- Determine time spent in unpaid and paid work of women and men.
- Determine Mongolian household patterns on time use and changes thereof.
- Obtain data essential to monitoring progress in the National Program of Gender Equality such as Gender equality in family welfare and development.

The 2004 revision to the Statistical Law required a national Time-use survey to be conducted every four years. Surveys were conducted in 2007, 2011, and 2015. The survey improved over the years with the expansion of the reference period and number of people covered (3200 households, 4000 households, 4000 households respectively). Surveys were conducted throughout the year – in March, June, September and December. Regular reports were published with preliminary (tables) analysis in Mongolian.

In these surveys, the data collection process, including checking and giving advises on the filled time diaries, were conducted through several household survey visits by NSO staff.

In order to use the time and resources more effectively from the perspective of both participant and data producer, for the TUS 2019, NSO of Mongolia decided to use CAPI for the household questionnaire part of the survey and a mobile application for the diary part.

2. Methodology

Progress in technology has made it possible to collect data through mobile devices. Mobile application surveys need to be downloaded to a mobile device by respondents from the web. This can be done separately for a specific survey questionnaire or there may be a general software application where the installation needs to be done only once. This then enables further questionnaires to be received and completed from a mobile device.

When conducting surveys, mobile applications are usually used for two main purposes: displaying the questionnaire and data management. The ability to display the questionnaire on a mobile device is a defining characteristics of mobile application surveys. This is also referred to as **passive mobile survey application.** When the application also supports data management, it is often referred to as **active mobile survey application.** The main difference between two types is that in the former the data connection is always online, but online/offline in the latter. In active mobile applications surveys, questionnaire completion can be done without a web browser and also without interaction with a server. In this case, the web is used only to exchange empty and completed questionnaires.

The following are the main advantages of mobile application surveys:

- The questionnaire can work without an Internet connection. It is only necessary to download the questionnaire and to submit it, which may be done immediately after the response session or later.
- The app can integrate its own interactive functionalities, like prompts, sending messages, trigging alarms, and can be "active" at all times even without the Internet connection.

Main disadvantages of mobile application surveys are listed below:
- The app must be downloaded and installed on the device prior to answering the survey(s).
- It also needs to be reinstalled whenever the respondent replaces the device, which, unfortunately, can happen quite often. This increases the respondent's burden and reintroduce concerns about the safety of required downloads.
- The app needs to be programmed and designed for each specific operating system (at least for iOS, Android), which substantially increases the cost and development time.

In Time use Survey 2019 of Mongolia, the initial data collection process steps were as follows:
1) On the first visit, interviewers used CAPI for the household questionnaire and respondents were asked if they want to use a paper diary or mobile application for the diary.
2) If the respondent chose to use a paper diary, a brief explanation was provided by the interviewer and this method was used throughout the survey.
3) If respondent chose to use the mobile application, interviewer created an account and password for the respondent with CAPI system and provided guidance on how to install the mobile application to their mobile phones. Interviewer also gave a guideline on how to fill out the diary using this application.
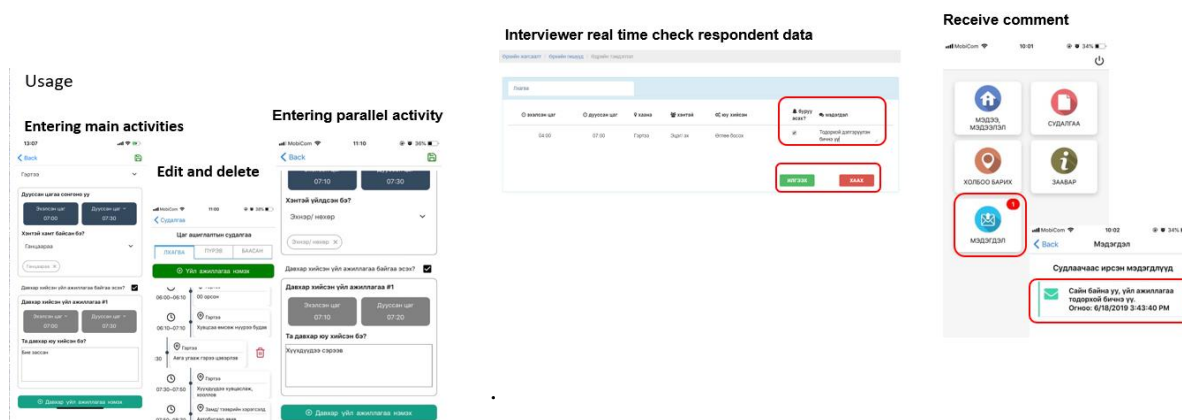
The following process was used for data collection and monitoring:

1) Respondents filled the diary whenever they could within the day.
2) Interviewers could monitor and give guidance to the respondent directly using the interviewer CAPI system. In case the respondent provided inaccurate or incomplete data or asked for advice on filling the diary, the interviewer provided the required information by notification.
3) If the respondent did not provide any response, the interviewer reached out to the respondent by calling.
4) The data collection process was closed once the interviewer checked the data collected, usually 2-3 days after the data was submitted by the responded.

This household-based survey was conducted on a quarterly basis (four quarters in one year) and sample size for 1000 (4000 in total). Out of 1000, 300 households were selected from the capital city, Ulaanbaatar, and the remaining 700 from the rest of the country. Pilot mobile application survey was conducted in Ulaanbaatar during the 2nd quarter. Data were collected from 31 respondents belonging to 21 households. In the 3rd quarter, data were collected through the mobile application from 154 respondents in 96 households. And in the 4th quarter, 66 respondents in 51 households provided data through the mobile application

3. Results:

Offering participants to use of mobile application survey as an alternative method to fill out the diary when they are available reduced the respondent burden and also created interest in participation in the survey.

Interviewers were able to check/monitor the data, communicate with the respondents by sending notifications, reaching out them in case of incomplete/inaccurate data. This contributed to the improvement of data quality.

Interviewer didn't need to visit to households for data collection and data checking/monitoring. This directly reduced the time, budget and human resources to conduct this survey. In terms of data dissemination, reduced time allocation helped in producing timely data.

It is also worth to mention that using a mobile application survey was a benefit for the environment.

4. Discussion, Conclusion and Recommendations

Mobile applications survey is a good alternative to traditional data collection methods given the rapid spread of mobile devices. Mobile application surveys have their own advantages and disadvantages.

NSO of Mongolia used a mobile application to conduct the TUS 2019; both statisticians and IT staff gained experience and improved their knowledge. NSO of Mongolia is planning to use this method in other "easy" surveys; lengthy and complex surveys such as establishment surveys may not be suitable for mobile application surveys. Necessary steps will be taken to improve and customize the application.

Application can be improved by registering the respondents, grouping them and offering survey incentives. More broadly, they can also be used to build statistical literacy and awareness by providing the latest statistical information and explaining statistics.

When conducting surveys, NSO of Mongolia faces a number of challenges including large distances between population centers, nomadic lifestyle of a significant number of people, an address system that has not been standardized, and low levels of trust of the respondents that data will not be used for non-statistical purposes. Considering these issues, conducting the survey using one method was not convenient, this is one of the reasons why we decided to use mix mode survey methods to collect the data efficiently and produce accurate and timely data.

Throughout the survey, we faced below challenges and they need to be considered for the upcoming mobile application surveys:

- Mobile application was only applicable for respondents who have mobile phones.

- Respondents had phones but did not have access to internet connection. We could manage this by providing free internet data. This motivated the respondents and increased the response rate in the end.

- Some respondents' concern about the confidentiality of uploading the application into their mobile phones.

- Respondents had more than one phone

- Interviewers had a tendency to use the traditional method.