

TESTING OF THE HCSO MOTUS APPLICATION, TIME USE SURVEY

METHODOLOGICAL REPORT

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CONTENT

Testing of the HCSO MOTUS application, time use survey (OSAP: 8088) 2

Preparing the field trial of time use survey..... 2

 Goal of the field trial of time use survey 2

 Implementation of the time balance test recording 2

 Elements of data collection 2

 The tool for the field trial..... 5

 Departments participating in the study and their tasks 7

 Education, Culture and Time Use Statistics Section 7

 Household Surveys Data Collection Department 8

 Interviewers..... 8

 IT Department 8

 Methodology Department 8

 Software testing..... 8

 Limitations of MOTUS..... 9

 Letters of invitation 10

 Training of the interviewers 10

Implementation of the survey 10

 Results and progression..... 10

 Visiting respondents, who have moved..... 13

 Contact and help..... 13

 Disposition codes..... 13

Closing of the field trial 13

 Purchase voachers 13

 Address lists..... 13

 Cognitive questionnaire..... 14

Coding, creation of the database 16

Summary 16

TESTING OF THE HCSO MOTUS APPLICATION, TIME USE SURVEY (OSAP: 8088)

PREPARING THE FIELD TRIAL OF TIME USE SURVEY

GOAL OF THE FIELD TRIAL OF TIME USE SURVEY

The main purpose of our field test is to contribute to the modernization of data collection technology for harmonized European time use survey by testing new technologies. The previous time use survey in Hungary were paper-based population surveys (PAPI) conducted with the help of interviewers, but the modernization of the recording method is inevitable nowadays. The next tool for data collection in Hungary for the HETUS 2020 recording wave may be an application called MOTUS, developed by hbits-VUB.

The goal of the field test of this time use survey is to get to know the MOTUS data collection software platform and to adapt it to the HCSO data collection architecture, to prepare the data collection activities of the 2020's European time use recording wave in Hungary. The MOTUS software platform includes the Motusbuilder, and MOTUS's data collection website, and applications for Android and IOS.

The purpose of the field trial was to investigate how data collection can be implemented in an electronic way instead of the previous paper-based recordings, and whether MOTUS devices are suitable for use in the main study. In addition, we wanted to test the respondent's willingness to fill on their own during the field trial.

First work for the field trial has begun in April 2021. The submitted application to Eurostat was also the part of the first work.

The main goal was to modernize the method of Time Use Survey data collection in Hungary, and to use modern electronic data collection tool instead of the previous, paper-based data collection method. An additional goal of the field trial was to integrate the internationally developed electronic data collection system called MOTUS into the infrastructure of the HCSO.

IMPLEMENTATION OF THE TIME BALANCE TEST RECORDING

Individuals sampled in the survey can participate independently or with the help of interviewers. Data collection will take place from 12 February to 16 March 2022. Individuals included in the data collection sample may begin recording on February 12 with the username and password provided in the pre-sent invitation letter. This can also be done on the survey website or in a phone application.

Prior to the field test, the recording tools were prepared: questionnaires, diaries and invitation letters, materials supporting the work of the interviewers (interviewer's guide, aids).

ELEMENTS OF DATA COLLECTION

Questionnaires and diaries were used during the data collection.

The Household Questionnaire contained questions about the household composition; household equipment; help and support received from another household; household income; expenditure; the travel habits of the household and information about all members of the household.

The Individual Questionnaire contained questions related to the respondents' citizenship; economic activity; participation in training and education; computer and internet use; cultural habits, participation in sports; participation in voluntary work, foundations and organizations; health condition; time use; and satisfaction with life. An abbreviated questionnaire was made for children aged 10-14, focusing on questions related to education, cultural habits, and the use of electronic devices.

The activities of the diary day were recorded in the diaries. During the field trial, two diaries had to be completed, one for a weekday and one for a weekend day. The activities had to be recorded as accurately and in as much detail as possible. The respondents were also required to answer additional questions related to their activities, such as: with whom did they perform the activity; where did they carry out the activity; whether they used an ICT tool; whether they carried out another activity in parallel. The activities could be selected from the predefined activity list.

The 2009/2010 survey's activity list was used for the field trial, and it was updated and modified following the HETUS 2018 guidelines.

The activities were divided into 10 main categories: personal needs; employment (main and second job); study; household and family care, voluntary work and meetings; social life and entertainment; sports and outdoor activities; hobbies; travel. If the respondent could not find the activity within one of these main categories, they had the option to record "other unspecified leisure activity" or "other, unspecified activity". In the case of the latter, the respondents had the opportunity to specify their activity in a text box. In addition, there was a "recording the time use in the diary" activity, indicating how long they spent recording their activities.

In addition to the integration with HETUS, applicability in MOTUS was an important consideration when developing the activity list. Self-completion and use of electronic means (mobile applications (s) and web platforms') required simplification and a less detailed structure for the activity list. Thus, we changed the categories for employment: the distinction by agriculture and non-agriculture employment was abolished and only the distinction between main and secondary employment was used. In addition, the distinction by socially bound, physiologically bound and freely performed activities was abolished.

There have also been some changes in the main categories and sub categories of activities. The changes are detailed in the table below

| 2009/2010 activity list | 2022 field trial activity list |
|---|--|
| „Socially bound”, „Physiologically bound” and „Freely performed activities” as main categories | No „Socially bound”, „Physiologically bound” and „Freely performed activities” main categories |
| „Study” and „Employment in „Socially bound” main category | „Study” and „Employment” are two different main categories |
| “Employment” breakdown by agricultural and non - agricultural activity | No distinction between agricultural and non - agricultural activity |
| „Shopping and services” in „Socially bound” main category | „Shopping and services” in „Household and family care” main category |
| „Caring for children, the elderly and the ill” in one category, in the „Socially bound” main category | „Caring for children, the elderly and the ill” in different categories („Childcare” and „Help to an adult household member”) within the „Household and family care” main category |
| Sick in bed, treatment of own illness in „Socially bound” main category | Sick in bed in „Sleep” category. „Treatment of own illness” in „Other or unspecified personal care” |
| Eating and drinking in different categories | Eating and drinking in the same category |
| Social, family, community activities | New name: Social activities, voluntary work and meetings |
| „Reading and Free time study” in the same category within the „Socially bound” main category | Reading in the „Mass media” main category, „Free time study” in „Study” main category |
| „TV, video and DVD” in the „Socially bound” main category | „TV, video and DVD” in the „Mass media” main category |
| „Listening to radio, recordings, computing activities in one category, within the „Socially bound” main category | „Listening to radio, recordings and Computing activities” in different categories. „Listening to radio, recordings” in the „Mass media” main category. „Computing activities” in „Hobbies” main category |
| TV channels listed as different activities | TV channels are not listed as different activities |
| Listening to radio is broken down into public service radios and commercial radios | Listening to radio is not broken down into public service radios and commercial radios |
| Gardening and pet care in Other entertainment and cultural activities” | Gardening and pet care in „Household and family care” main category |
| Hobbies, crosswords and „Amateur, artistic hobbies and activities” in „Other entertainment and cultural activities” | Hobbies, crosswords and „Amateur, artistic hobbies and activities” in „Hobbies” main category |

| | |
|---|---|
| „Visits to cultural and entertainment institutions” az Other entertainment and cultural activities” | „Entertainment and culture” in „Social life and entertainment” main category |
| „Other freely performed activities” az „Other, unspecified activities” | „Other freely performed activities” as „Resting, time-out” in Social life and entertainment” main category |
| „Unknown or unclassified activities” in a „Freely performed activities” | There is no „Unknown or unclassified activities”, instead: Unspecified leisure time, Other unspecified time use and Filling in the time use diary |

An additional questionnaire was created for the diary day, which included questions about the characteristics of that day. These included questions were about, for example, the date of the diary day, how was the weather that day, what activities were tiresome for the respondent, what activities the respondent found pleasant or unpleasant, whether the respondent was working or in school that day.

THE TOOL FOR THE FIELD TRIAL

During the field trial the MOTUS software was used for completing the survey.

The MOTUS is a software platform created within the framework of an international consortium. The members of the consortium, the Belgian statistical office (STATBEL), the German Federal Office (DESTATIS) and the Vrije Universiteit Brussel (VUB) in Brussels, intend to introduce the MOTUS they have developed into official statistics on time use and other diary-based data collection.

In the field trial the software was adapted to the Hungarian data collection by the Hungarian Central Statistical Office, in cooperation with the time use research group of the University of Vrije Belgium. MOTUS has two different platforms: the back office and the front office.

1. The researcher’s side of MOTUS

The “back office” of the software platform is the administrator’s side, called Motusbuilder. This is where is possible to create a complete research, including the questionnaires, diaries, communication and the research flow. The results of a research can be exported in Motusbuilder as well. All of the research elements can be created in the so-called Builders.

The researches appear on the Dashboard of the software, from where the settings of the research can be configured. The researches, the number of participants in the given research and the status of the given research (under development, active, finished) are all displayed here.

1.1. Survey builder

Questionnaires and more than 10 different types of questions can be created in the Survey builder. Additional questions (e.g. where did the activity took place, with whom the respondent

did it) for the activities recorded in the diaries can also be added in this builder. A previously created questionnaire can also be added to a new research.

1.2. Diary builder

Activity lists and diaries can be created in the diary builder. A main and parallel activity list can be defined there. Also, additional questionnaires can be added here to the activities. In addition, tags can be added to the activities, which help the respondent search and choose an activity from the activity list. The duration, focus days and closing criteria for the diaries can be defined here. A previously created diary can also be added to a new research.

1.3. Communication builder

In Motusbuilder it is possible to establish communication with the respondent. In-application notifications and e-mail messages can be defined in the communication builder. These can be built into the research flow and adapted to the progress of the research, for example a reminder messages can be sent to the respondent if they have finished or started a certain research element for some time, or successfully completed a research element.

1.4. Flow builder

The flow of each research must be defined, that is, in what order of the research elements should be. This can be done in the flow builder. Elements of a research can be created only in different builders, but these elements must to be built in in the research flow – without doing this the research cannot be conducted. Events can also be set in the flow builder. These are reactions from MOTUS, that are triggered by something that happens or something the respondent does (e.g. finishes a questionnaire). These reactions can be for example sending the respondent to the next stage of the research or sending them a questionnaire.

1.5 Invitation builder

In MOTUS, respondents can be added manually or imported from already existing files. This can be done in the invitation builder. Each respondent has their own ID and password. A first name and last name, an e-mail address can also be added to a respondent. Several different surveys can be assigned to each respondent.

1.6. Results builder

Data from the questionnaires and diaries can be downloaded from the results builder. Para data (e.g. start/ending time of a questionnaire or a diary) can also be retrieved from here.

1.7. Geofence builder

MOTUS can also collect data via geotracking, which can be set up in the Geofences Builder. It uses a so-called background tracking, which means the respondents' movement can be tracked not only when they are actively using the app, but also whenever they have their phone with them. Area-specific research can benefit from the use of geofences. These can be used to define certain areas (geofences) on the map. Events can be set for these geofences, that appear when

the respondent enters or exits this area, e.g., a questionnaire pops up. This feature is currently being tested and was not used during the field trial.

2. Respondent's side of MOTUS

The front office is the respondent's side of the software. There are two ways to reach the front office side: via a website or downloading the MOTUS applications available in iOS and Android stores. Therefore, the respondents have two options to log in and participate in the data collection: via a website or a mobile application.

A linear research flow can be defined in MOTUS, where parts of the research (questionnaires, diaries) come together in a specific structure, one part of the research follows an other. When one stage of the research flow is completed (e.g. a questionnaire or a diary is finished), then the respondent can proceed to the next stage. The research flow, and how many stages are finished and need to be finished are displayed to the respondents in the website / mobile application.

The respondent's side of MOTUS was designed for self-completion in mind. Therefore, MOTUS does not have an interface for interviewers, so they cannot do their administrative tasks there. At the same time, we also used interviewers,1hel during the field trial. It was therefore necessary in several cases to redesign the questionnaires in order to be able to administer certain tasks related to their role. How the interviewers managed their administrative tasks during the field trial will be discussed in the next chapter.

DEPARTMENTS PARTICIPATING IN THE STUDY AND THEIR TASKS

EDUCATION, CULTURE AND TIME USE STATISTICS SECTION

The statisticians of the Education, Culture and Time Use Statistics Section adapted the paper-based questionnaires and diaries of the former time use survey to MOTUS. This included household and individual questionnaires, an activity list, additional questions about the activities, and a questionnaire for the diary day. In addition, automatic e-mail communication to the respondents was also set by them. The colleagues of the section completed the tasks in the preparations of the survey, in the creation of the elements and process of the research. The section was responsible for the communication with the hbits-VUB.

During the preparations for the field trial, they prepared the interviewers guide, the respondents guide and the data protection document. Prior to the field test, they tested the research flow and the research elements (questionnaires, diaries) in MOTUS.

During the field trial, the statisticians of the Department provided ongoing e-mail and phone assistance to both the interviewers and the respondents. Inquiries were mainly received from the interviewers, regarding the problems and questions that arose during the field trial. The incoming results were continuously monitored, and the successful and unsuccessful cases were summarized. If necessary, problematic cases (e.g. not clear if completion happened with or without the help of the interviewer) were discussed with the interviewers for clarification.

Following the completion of the field trial, they analysed the number of logs received, the unsuccessful and successful cases. Also, they conducted cognitive interviews with 16 individuals who had already completed the survey.

HOUSEHOLD SURVEYS DATA COLLECTION DEPARTMENT

The employees of Household Surveys Data Collection Department sent interviewers “packages” containing the questionnaire, diaries, activity list, interviewer manuals for MOTUS, invitation letters, address list of the sampled individuals. They sent purchase vouchers to the respondents, that successful completed the survey. They were also responsible for writing and sending the invitation letters to the respondents.

INTERVIEWERS

The 22 interviewers employed by Statek Ltd. had started their work in the second week of the field trial, from 21 February. The interviewer’s had three weeks to persuade respondents who did not start filling out on their own to take part in the survey. Their task was to visit the sampled persons who did not start the survey yet, and to present them the survey, furthermore encourage them to respond. The task of the interviewers was to fill in or convince to fill in the questionnaires and to administer the cases.

Data collection could take place in several ways. In case of a successful conviction – if requested by the respondent – the questionnaires were recorded with the help of an interviewer personally, and paper-based diaries were uploaded to MOTUS. If the designated person agreed to participate completely on his or her own but did not start within a week, it was the interviewers’ task to revisit that person and remind him or her to complete. Interviewers had to take notes on their address list containing additional information about respondents. They had to send their address list and paper-based diaries to the employees of HCSO if there were any.

IT DEPARTMENT

The staff of the IT Service Department participated in the import of the respondents into MOTUS, generated passwords and usernames for the respondents, and managed the connection between MOTUS and the LAKOS system. They kept contact with the international developers. In addition, they purchased the tablets for the interviewers, installed MOTUS on them, and they exported and converted the data incoming from MOTUS.

METHODOLOGY DEPARTMENT

The members of the Methodology Department of the HCSO selected the sample of the field trial. The 504-person sample of the research included residents aged 10-84 from 21 different settlements. The selection was performed using a mathematical statistical method, and the respondents were randomly sampled.

SOFTWARE TESTING

Before the pilot survey, MOTUS was tested with staff from the Department of Education, Culture, Time Use Statistics, the Household Survey Data Collection Department and the Department of Earnings Statistics. Testing began in early January and was ongoing until the start of the trial survey. For testing, we created test users that could be used to complete the research elements on the MOTUS interface. Test surveys were also created during testing,

The entire process of the research was tested, in the same order as the respondents went through the questionnaires and diaries. The correct order of the questionnaires and questions and the logical jumps based on possible answers were examined. For diaries, we tested whether respondents could search for activities in the list, whether the labels worked, and whether the activities were associated with the appropriate questions.

The remarks and problems that arose during the testing were recorded in writing and with screenshots, and the errors were eliminated with the help of the developers, if it was necessary.

LIMITATIONS OF MOTUS

Some limitations of MOTUS were identified during the adaptation of the previously used research element. It was necessary to modify the paper-based questions, because certain types of questions were not available in the software (e.g. spreadsheet type question).

When adding the research elements, we noticed that certain necessary settings and commands could not be performed yet, so we duplicated and multiplied some questions, and in some cases we added instruction for questions. In certain cases, we wanted to prevent the respondent from proceeding to the next question if they answered a certain way, but this was not possible in MOTUS.

For multiple choice questions, we were unable to maximize the number of answers the respondents could give. In the case of checkbox type questions, setting the question required did not work.

In the previous time use survey in Hungary, in addition to a primary activity, two secondary, parallel activities were recorded. MOTUS, on the other hand, allows a maximum of two activities (one primary and one secondary) to be recorded, so a second parallel activity cannot be recorded.

During the field trial, the notifications function in MOTUS was not available, only e-mails could be sent to the respondents.

The MOTUS software supports self-completion of the activities. During the field test, in addition to testing the softer, we also tested the willingness of the sampled person to fill in independently, but taking into account the Hungarian conditions, they felt the need the help of interviewers. The Motus software does not have a compilation interface that would be required for the Hungarian time use survey (interviewer interface). Here they would have the opportunity to record the visits, the failures, the changes in the address of the persons included in the sample, and to see the status of the respondents (e.g. waiting to be visited; started independently; completed research).

LETTERS OF INVITATION

Each resident in the sample received a unique username and password to use the software. These were received by post, in a letter of invitation, together with the most important information of the research and instructions for completing it.

Different letters of invitation were sent to adult and respondents below 18 year of age. In addition to usernames and passwords, these included a brief description of the trial survey, information about who and how can respond, privacy information, a link to the MOTUS website, and the QR code for the app.

The letters of invitation were mailed between 7 and 10 February, so that the residents included in the sample could start filling in on their own by the starting date of 12 February. The text of the letters of invitation was written by the staff of the Department of Education, Culture and Time Use Statistics in cooperation with the staff of the Household Surveys Data Collection Department, and they were mailed by the latter.

TRAINING OF THE INTERVIEWERS

During the survey, interviewers assisted in data collection. 22 interviewers worked in 21 different settlements. The interviewer's guides were prepared at the beginning of the research, and the tablets required for data collection which contains only the application of KSH MOTUS. The guide included: activity list, paper diary, answer cards, completion guide, mailing list, questionnaires, sample letter of invitation.

Interviewer training took place over two days on virtually, on 16 February (one morning and afternoon training) and 17 (one morning training), for a total of three groups. One training session covered three hours, during which three main topics were reviewed (presentation of time use surveys, trial survey process, use of MOTUS), and then the interviewers had to complete two tests. A total of 22 interviewers took part in the training. The training took place online, via WebEx. Following the training, the interviewers began their work on February 21st.

IMPLEMENTATION OF THE SURVEY

RESULTS AND PROGRESSION

In the first week, respondents could start the survey independently, without the help of interviewers. The interviewers started their work on the second week: they visited the sampled individuals, tried to persuade them to participate, helped them completing the survey.

Results from the questionnaires and diaries were continuously coming in during the period of the field trial. These were exported into spreadsheets and the Education, Culture and Time Use Statistics staff monitored them on a daily basis and summarized the results and progression in a spreadsheet. The number of diaries received was not evenly distributed during the one-month period of the field trial: for both the first and second diaries, fewer ones were completed in the first two weeks of the field trial, while the majority of them were received in the second two and a half weeks.

1. Finished diaries, weekly breakdown

| Week of the field trial | 02.12-20. | 02.21-27. | 02.28. – 03.06. | 03.07-13. | 03.14-16. | Total |
|-------------------------|-----------|-----------|-----------------|-----------|-----------|------------|
| First diary | 7 | 6 | 27 | 35 | 23 | 98 |
| Second diary | 5 | 2 | 23 | 33 | 31 | 94 |
| Total | 12 | 8 | 50 | 68 | 54 | 192 |

The regional breakdown of successful cases shows that only two regions had cases, where the questionnaires were completed on paper but the diaries were completed electronically, but the percentage of these cases were negligible in these regions as well. There are two regions where no completely self-completed case occurred. The highest success rate was in the Central Transdanubia region (more than a third of all cases) - all of which were completed with the help of an interviewer. In general, most of the successful cases in each region were completed with the help of an interviewer.

The completion rate was 19.4%. The proportion of the independently completed case did not reach 5% of these, the vast majority of the diaries received were paper diaries.

2. Regional results – successful cases

| Region | Completed successful cases | | | Total successful cases out of all cases |
|-----------------------|---------------------------------------|----------------------------------|---------------------------------------|---|
| | Completed with help, electronic diary | Completed with help, paper diary | Completed independently, without help | |
| Budapest / Pest | 1,3% | 6,7% | 6,4% | 15,3% |
| Western Transdanubia | 0,0% | 9,5% | 4,8% | 14,3% |
| Southern Transdanubia | 0,0% | 16,1% | 11,3% | 27,4% |
| Northern Hungary | 1,6% | 14,5% | 3,2% | 19,4% |
| Southern Great Plain | 0,0% | 15,9% | 2,4% | 18,3% |
| Northern Great Plain | 0,0% | 13,3% | 0,0% | 13,3% |
| Central Transdanubia | 0,0% | 37,0% | 0,0% | 37,0% |
| Total | 0,8% | 14,1% | 4,6% | 19,4% |

In all regions most unsuccessful cases were due to refusal to participate, and were high in the Northern Hungary region and Budapest / Pest County region. But in each region, at least nearly

a third of those sampled individuals refused to respond. The rate of unsuccessful cases for any reasons were exceptionally high in all regions, around or over 80%, with two exceptions: Southern Transdanubia and Central Transdanubia region.

3. Regional results – unsuccessful cases

| Region | Unsuccessful cases | | | | | | Total unsuccessful cases out of all cases |
|-----------------------|--------------------|--------------|--------------|----------------------------|-------------------|---------------------|---|
| | Invalid address | Moved | Refusal | No contact with respondent | Technical problem | Other (unspecified) | |
| Budapest / Pest | 0,0% | 15,3% | 50,0% | 2,0% | 0,0% | 17,3% | 84,7% |
| Western Transdanubia | 0,0% | 9,5% | 47,6% | 2,4% | 0,0% | 26,2% | 85,7% |
| Southern Transdanubia | 0,0% | 9,7% | 30,6% | 0,0% | 0,0% | 32,3% | 72,6% |
| Northern Hungary | 3,2% | 6,5% | 61,3% | 0,0% | 0,0% | 9,7% | 80,6% |
| Southern Great Plain | 0,0% | 14,6% | 37,8% | 0,0% | 0,0% | 29,3% | 81,7% |
| Northern Great Plain | 0,0% | 18,3% | 35% | 0,0% | 0,0% | 33,3% | 86,7% |
| Central Transdanubia | 2,2% | 8,7% | 34,8% | 0,0% | 0,0% | 17,4% | 63,0% |
| Total | 0,6% | 12,7% | 43,7% | 0,8% | 0,0% | 22,8% | 80,6% |

Significant differences in the response rates, the successful and unsuccessful cases between adult and child respondents are not present.

4. Adult and child results – successful cases

| | Completed successful cases | | |
|----------|---------------------------------------|----------------------------------|---------------------------------------|
| | Completed with help, electronic diary | Completed with help, paper diary | Completed independently, without help |
| Adults | 0,8% | 14,0% | 4,7% |
| Children | 0,0% | 16,1% | 3,2% |

5. Adult and child results – unsuccessful cases

| | Unsuccessful cases | | | | | |
|----------|--------------------|---------------------------------|---------|----------------------------|-------------------|---------------------|
| | Invalid address | Moved within or outside country | Refusal | No contact with respondent | Technical problem | Other (unspecified) |
| Adults | 0,6% | 12,9% | 43,3% | 0,8% | 0,0% | 22,8% |
| Children | 0,0% | 9,7% | 48,4% | 0,0% | 0,0% | 22,6% |

VISITING RESPONDENTS, WHO HAVE MOVED

There were cases where the sampled person didn't live at the address listed on the address list anymore. If the interviewer could find out the new address and if it was in the same settlement as the original one, they visited the sampled person at their new address. This happened in several cases, and if the case was successfully completed, then the voucher was sent to the correct (new) address.

CONTACT AND HELP

During the field trial, the interviewers could contact the staff of the Education, Culture and Time Use Statistics Section and the IT Department with their questions by phone or through e-mails. Issues mainly related to technical problems, disposition codes, and recording of activities in the diaries were raised. The respondents could send their questions and problems to the e-mail address idomerleg2022@ksh.hu. Only one request was received, asking about the vouchers.

DISPOSITION CODES

It is currently not possible to record failure codes as a stand-alone function in MOTUS. So, a question related to disposition codes needed to be built into the household questionnaire. The interviewers could record codes for the unsuccessful cases there. The recorded codes for unsuccessful cases were reviewed, and the codes needed to be fixed in two cases: in both cases the interviewers mistakenly recorded them as “technical problem”, even though no technical difficulties occurred. The interviewers' visits also could not be recorded in MOTUS. Therefore, the interviewers needed to record all the information related to visiting the sampled person on their address list. They had to inform the staff of the Education, Culture and Time Use Statistics Section about these visits.

The codes for completed successful cases were recorded after we received all part of the questionnaire. The code was recorded depending on whether it was completed independently without help, completed partly with help (electronic diary) or completed with help (paper-based diary).

CLOSING OF THE FIELD TRIAL

PURCHASE VOUCHERS

A filled diary was required for a successful completion. Each respondent received 2,500 HUF for every filled diary, so if the respondent had two successful diaries, they received 5,000 HUF. After the professional review the voucher was received by the respondent by post. A total of 98 respondents were sent vouchers, of which four individuals completed only one diary.

ADDRESS LISTS

After the survey ended, the paper-based address lists were collected from the interviewers, who returned them to the staff of the HCSO in a reply envelope. Interviewers whose address lists did not return within one week received a reminder email to send their list back.

COGNITIVE QUESTIONNAIRE

Following the field trial, a cognitive questionnaire was compiled, which included the questions from the field trial (from the household, individual, and diary day questionnaire) and related supplementary questions. The purpose of these additional questions was to examine the questions used in the field trial. With the help of the supplementary questions, our goals were to find out if the questions were understandable; if the answer categories were clear; if all the possible answer categories were covered or if the respondents would like to give an answer, that is not listed; if the instructions and additional information for the questions were clear.

For the cognitive test, we asked 18 individuals to participate, 16 of whom did agree to participate. They had previously completed the questionnaires and the diary. Two individuals refused to participate. The cognitive questionnaire was conducted in person, orally, or over the phone, and the answers were recorded on paper. The questions included in the pilot survey were immediately followed by the cognitive questions related to them. Comments and remarks made about the survey and the questions were also noted. Subsequently, responses were also recorded in MOTUS, in a new research created just for the cognitive questionnaire.

In the cognitive questionnaire, we included one question about the list of activities used for the diaries in the field trial, and 10 main questions from the questionnaires (household, individual, diary day), to which a total of 34 additional questions belonged.

The following questions were included:

- How many households are there at this address?
- How many families live in this household?
- In terms of labour market status, which of the following groups do you belong to?
- Does the household use / own a car? What is the year of manufacture? Typically, what do you use it for?
- Have you or any other member of the household received help (or support / service) in the last 4 weeks from someone who is not a member of the household?
- What is your average monthly net income?
- Do you usually read a daily newspaper (several times a week)?
- Have you read a book (outside of a textbook/school book) in the last 12 months?
- Overall, how meaningful do you feel the things you do?
- How stressful was the diary day for you?
- What activity was missing from the activity list that you wanted to record but could not find?

Based on the result of the cognitive test, the examined questions were clear to the respondents. The concepts of household and family were also comprehensible. Based on these definitions, only a few respondents changed their answer to the number of households and number of

family's questions. Some questions' wording was considered too general, and not clear enough, and thus the respondents found it more difficult to answer them, for example the question "Overall, how meaningful do you feel the things you do?". Additional questions revealed that the respondents considered primarily work and leisure when answering this question.

For most of the questions, the respondents did not miss any answer categories, they were able to choose the one that was most suitable for them from the existing ones. However, in the question about the genres of the books they read, there were genres that were not included in the answers (e.g. esoteric books), as well as some of them suggested to make the list of answers more detailed (e.g. science fiction, crime books, comic books should be on the list of answers). In addition, it was not clear what answer should be chosen as the most typically read genre in the case of foreign language books (6 respondents chose the foreign language, 8 chose the main genre (43-57%)).

In the case of the "Typically what do you use the car for?" question quite a few respondents found it difficult to select only one answer, as more than one category was characteristic of them, but giving only one answer was allowed.

Sensitive questions, such as questions regarding the respondent's income were more likely to be answered if the respondents could choose from income categories, or even if the data collection would not have been in person. Most of the respondents would like to choose from categories with intervals of HUF 100,000. Respondents with more income would like to choose from broader income categories.

The most frequently mentioned activities that the respondents could not find were activities related to mass media, for example: watching TV shows and movies (watching TV was included in the list), online streaming and also traveling home from work. There were some "missing" categories mentioned, that were actually included in the activity list (e.g., rest).

To test Geofence, it was necessary to download a new application (MOTUS Discovery), because the Geofence function was not yet built into the HCSO MOTUS application. The MOTUS Discovery application is not yet available in Hungarian because there was not part of the translation process. The testing involved 5 person and lasted for a week. Two features were tested during testing. One function was geotracking, the other function tested was geofence. Experience from testing has shown that a stable internet connection is required, without which tracking the respondent is more inaccurate. Based on the geotracking speed, it shows how the respondent travel (on foot, by bike, by vehicle) - this is usually accurately detected by the program based on the experience of testing.

Some problems arose during testing: the questionnaire appeared to the respondent 500 times once when crossing the geofence. In another case, the questionnaire appeared not at the crossing of the geofence but at the end of the diary. The questionnaire we used here was created specifically to test geofence and included the following questions: "Where did you go?" "How did you travel?" "How was the weather?". About half a minute after crossing the geofence, the questionnaire will appear. however, we feel uncertain about the appearance of the required questionnaire. The lack of the geofence and geotracking functions is that they are currently

unable to link the data from the respondent's tracking (where he went and when) to the activities recorded in the log. In addition, the use and usefulness of the geofence function in a nationwide survey is questionable, as it should be considered where these geofences should be defined for each of the sampled settlements. We did not have the opportunity to better understand the geofence and geotracking functions within the project.

CODING, CREATION OF THE DATABASE

In the database containing the data collected during the field trial, we coded the textual responses for some questions:

| Question | Codes |
|---|---|
| Where did it happen? (diary1) | nursery - 1; work - 2; workplace canteen - 3; home - 4; on he way - 5; no answer - 0 |
| Who did you do it with, who else took part in it, or who helped? (diary1) | student - 1; alone - 2; dentist - 3; kid - 4; family doctor - 5; little sister - 6; colleagues - 7; nobody - 8; no answer - 0 |
| Who else was present? (diary1) | students - 1; home - 2; dentist - 3; kids - 4; costumers - 5; little sister - 6; colleagues - 7; nobody - 8; no answer - 0 |
| Where did it happen? (diary2) | nursery - 1; work - 2; office - 3; home - 4; village - 5; hotel - 6; garden of other household - 7; Pogány - 8; no answer - 0 |
| Who did you do it with, who else took part in it, or who helped? (diary2) | student – 1; alone – 2; colleagues - 3 |
| Who else was present? (diary2) | my son – 1; colleagues – 2; nobody – 3; no answer - 0 |

Other text fields were not encoded, e.g. occupational sector. The free-text question from the activity is not coded either.

After encoding, the database was generated in the form of an SPSS file. During the database, the responses to each variable were analysed, examining the non-responses as well as the distribution of the variance of the response categories. The prepared analysis can be found in Appendix 1.

SUMMARY

The Hungarian Central Statistical Office is committed to keeping pace with technological development. The purpose of the field trial for the time use survey, conducted at the beginning of 2022, was to test an electronic data collection tool, the MOTUS software created within the framework of an international consortium, that could replace the paper-based data collection method. The other goal of the field test was to assess the willingness of respondents to participate independently, without the help of an interviewer.

During the field trial, the respondents had to answer two questionnaires, the household and the individual (for children aged 10-14 years old the child individual) questionnaires. These - in addition to demographic and household data - covered areas of everyday life, such as economic activity, usage of electronic devices or how people spend their free time. Then, they had to record two diary days, one for a weekday and one for a weekend day. In these diaries, they needed to record their daily activities throughout the day, as accurately as possible. Each diary was followed by a short questionnaire with additional questions about the diary day. The activities recorded in the diary could be selected from a predefined activity list.

MOTUS has two different platforms: one for the researchers (back-office) this is where the researches and all their elements can be created. And the other side is the front-office, where the respondents can record their answers to the questionnaires and the diaries.

The employees of several departments of the HCSO and STATEK Ltd. took part in the preparation, creation and implementation of the research. The staff of the Department of Education, Culture and Time Use Statistics created the research elements based on previous time use surveys, adapted them into MOTUS, and monitored the incoming data during the field trial and also kept in touch with the interviewers. The Household Surveys Data Collection Department sent out the invitation letters to the sampled individuals, and a “package” to the interviewers. The interviewers’ tasks were to visit the sampled individuals and encourage them to participate in the research. The sample was selected by the staff of the Methodology Department. The IT background was provided by the staff of the IT Service Department: they kept in touch with the software developers, procured the tablets and installed the application needed for the field trial, and helped to export the data.

In order to ensure efficient data collection, a training for the interviewers was conducted, in which they learned about the purpose and means of the research, the process of data collection and their most important tasks. In the first week of the data collection the respondents could participate only independently, without the help of the interviewers. The interviewers started their work in the second week of the field trial.

Regarding the results, the willingness to participate can be considered to be very low, with less than a quarter of the sampled individuals agreeing to participate. Based on the feedback from the interviewers, several sampled individuals would have liked to complete the questionnaires, but recording their activities in the diaries seemed like too much effort for them. Most unsuccessful cases result from refusal.

Despite the possibility of independent participation, in most of the successful cases both the questionnaires and the diaries were completed with the help of an interviewer.

98 sampled people agreed to participate, and we received 192 diaries. 94 respondents recorded two diaries, 4 respondents recorded only one diary day. The majority of the diaries (both first and second) were received in the second two and a half weeks of the field trial, the first two weeks showed less amount of activity.

Respondents, that successfully completed the survey were rewarded with a gift card for their participation in the research.

Following the research, cognitive interviews were conducted, in which it was tested whether the questions were understandable, clear, and whether the response options adequately covered all the most common answers. Overall, it can be said about the questionnaires that the definitions, additional information and the questions are understandable. The answer categories to the questions are complete, with a few exceptions, and the additional proposals received in regards to the activity list have been recorded.

The research had valuable experience, and this experience as well as the feedback from the respondents and interviewers will contribute to the main study.

MAJOR EXPERIENCE IN IT ISSUES

Contact with developers

In the beginning of the cooperation the developer team gave us presentations about the product itself. They had presented the APP, the back-office module, the survey module call-by-call, but we had not seen the working APP, back office, survey module until the start of the project. Moreover, we had not received the BETA APP neither, not until the first could have been done. Though we have asked for them to be able to judge, test, prepare ourselves for the test period. We have received the first version of the APP only few days before the beginning of the Field Test. There were difficulties over the communication on behalf of the developer team, they insisted to communicate only via e-mail, and it seemed to be working quite slow, which gave us a feeling of rush on our side to be able to prepare ourselves.

KSH Motus web and application interface development activities

There were several updates released during our test period which also gave us hard times to follow up, because we had not been informed at all that what kind of bug fixes or new features are to be released. It was always a malicious surprise to realise that something is not working when it was operating as should be on the they before. All in all, the bugs and releases came to a result, that we were able to use the APP though there were important features (e.g.: geodata collecting) missing from the APP during our field test.

Possibilities of connecting Motus with LAKOS

During the preparation phase we have asked for an API endpoint that could communicate with LAKOS, which a SOAP based system. for it we gave away our technical parameters and

description. (the delivery of the technical description to the development has been delayed on our part, here the communication problem can be the main problem a technical description).

At the end of the day we have received a JSON/REST API endpoint for which we had to develop a middleware to be able to process the received data. However, we have asked for a put endpoint to be able to send data through the API connection, but that was refused by the dev-team claiming that they had not prepared their side to receive data through API. We could only send mass-data to the DB by using the back-office module, but it worked out at the end.

Loading live and test users into Motus was sampled

We could upload the users and test users through the back-office module, though we had to have some support regarding the format of the uploaded file, therefore the dev-team had helped us out with useful hints, however the sample file was not convenient how to be filled out, and we had to reprocess our user data to be able to input all fields where they were required to be. In this case we have received quite quick and helpful support from the dev-team.

Acquisition of tablets, installation of an application

Installing the APP was not meant to be a difficult task, we have used the PARENTAL function of the google services in order to be able to provide secure data collection. All tablet's functions were reduced only to the minimum services in order to be able to use KSH MOTUS APP. Though there was a smaller misunderstanding regarding the required APP name, but it had been solved, though it meant on our side that we had to install the APP on the tablets once again. There was also a smaller delay in the publication of the APP , but it had not affected the starting date of the FIELD TEST.

Retrieve results, "clean up"

By developing the middleware for the JSON/REST API and LAKOS module all downloaded data were clean and readable and useful.

Annex 1

[D10 methodology.7z](#)