         

**STATEC**

**ESSNET SMART SURVEYS WP2**

**Q&A FOR WP2.1 HOUSEHOLD BUDGET SURVEY APP**

General:

* Can we choose other subthemes than food?: Not in the ESSnet phase 3 field test. This should have been suggested during the application stage. However, one of the main objectives of the ESSnet is to develop tools that are modular/flexible. In the development of the app, it is an explicit requirement to create a tool that can be modified quickly to other subthemes.
* What COICOP categories to report in-app and what COICOP categories to handle through online questionnaires?: Currently, the app does not make an explicit distinction and all categories could be reported. However, it is assuming infrequent purchases with many products, because there it is that an app, and in particular receipt scanning, become very attractive from a respondent burden point of view. It is anticipated that larger, recurrent expenditures, such as housing, insurances, mortgage, energy can be reported in online questionnaires. In the ESSnet field test, one such block will be included in the app. It has yet to be decided in the ESSnet WP2.1 what is the ideal distinction between in-app and online reporting of purchases.
* How much tailoring of the app can be done before Sept 1st?: The planning is as follows: Between March and June, the app language, shop type lists and product lists are tailored. These adaptations do depend on the availability of such country lists. It is assumed that product lists may still be imperfect and list of shop names are absent. Between June and December, also the receipt scan processing will be tailored, but this does depend on the country’s decision to participate in the field test.
* Is a country test report expected, and if so, when?: An overall report will be prepared about specifications for the HBS app, including a list of generic versus country-specific features. Explicit test reports are not requested from countries as the app has already been tested in four countries. However, a small questionnaire will be prepared that is to be answered by countries. This list will be provided in the coming months.
* NEW Can the Sept 1st deadline for phase 3 opt in be extended?: We are currently investigating whether it can be extended to December 1st. This is only feasible if ESTAT accepts the risk that we have only two countries in phase 3 under the scenario where all countries opt out.
* NEW What will the anticipated receipt scan pipeline look like? The pipeline concerns both the frontend and backend. The following steps are foreseen: 1) in-app scan of receipt using an overlay to detect the receipt, 2) in-app OCR and check by respondent, 3) in-house additional OCR to derive products and prices, 4) in-house classification to COICOP, 5) in-app check by respondent of classified receipt. The exact division of work between steps 2 and 3 still needs to be decided. Step 5 for the setting without EAN/GTIN product descriptions will most likely not be realized before phase 3.
* NEW What kind of receipts can be added to the app, only scanned or also digital? It is important to keep in mind that receipt scanning or reading is included to reduce respondent burden. The focus is therefore on receipts with many items which are often linked to specific types of shops. Nonetheless, we foresee that digital receipts may be the future and also, to date, quite a few shops offer digital receipts. If the digital receipts are structured PDF, then it will be fairly straightforward to read them when the app is granted access to the mobile device folders and receipts are stored at the device. If receipts are not structured, then reading may have to go through an in-house procedure. We are closely monitoring options and it is on the TO DO list.
* NEW Is it possible to have the length of the purchase reporting period as an open parameter? The length of the data collection period can be specified as a parameter and the calendar is changed accordingly. At the end of the reporting period, the app can still be used but there is no more validation or data exchange. For now, we do not force the app to close as we believe respondents may like to use the app beyond the HBS.
* NEW Can the app be restricted to a subset of COICOP codes? Yes, but this mostly will have to be done in the recruitment of the respondent and the way the respondent is guided to the app. For now it still is open how much we will allow respondent to do in the app and how much on other modes such as paper/online. Ideally, we foresee a tool that can be done on any device. This topic is an open question we like to suggest for a HBS-TUS innovation grant.
* NEW Add question after yes/no biological product? The categorization of biological is a product characteristics and not a purchase characteristics. This means the respondent has to flag this for each item that is bought. This is not yet foreseen, although it would not be hard to add. We would also need to be able to derive from receipts whether this holds. It is a feature to discuss at a TF HBS.

App backend:

* Where will data be collected/stored?: During the ESSnet, data is collected and stored at Stat Netherlands. For the basic tests and/or usability tests it can be decided to disconnect the backend, but during the field tests data needs to be collected. Two remarks: 1) Ultimately, the goal is to let NSI’s implement a backend. WP2.1 will attempt to assists as much as possible through backend specs, already partly available as deliverable of ESTAT project @HBS. So the ESSnet data collection at NL is temporary, 2) data storage and processing needs to be communicated very clearly with respondents. During the ESSnet, in collaboration with WP3, we will set up a matrix of privacy protection features x country x type of data.
* What paradata are available?: We are considering two types of paradata. The first is paradata on registration, any in-app activity and completeness of data. This paradata is already available. The second type of data are in-app plugins to monitor use of certain screens and buttons. This type of paradata will be developed during the Summer and the NL field test serves as proof-of-concept. Paradata can be disabled anytime. Paradata about interviewer recruitment is not collected by Stat Netherlands.
* What happens if we cannot deliver EAN/GTIN product descriptions?: The easy option to implement classification is through product descriptions that are liked to (E)COICOP. At Stat NL this is done on a continuous basis for metadata of scanner transactions data. Without EAN/GTIN (barcode) the only alternative is to train machine learning models based on a database of annotated receipts from a range of shops.
* Will the app data be synchronized with other devices?; For now, the app is synchronized through the backend, i.e. each device that is linked to the same user/household will see the same data. To date, the app UI has not been made responsive for tablets and laptop/desktops. This is a functionality on the TO DO list. We are not yet sure at what time point it will become available. It will not be available during the basic tests (up to August 2020).
* NEW What is the backend database structure? The database model is available in @HBS deliverable Backend specifications and also included in the CSPA documentation.
* NEW What are the EAN/GTIN product descriptions for? Scanned receipts go through two main steps: text recognition and classification. The product descriptions are for the second main step, i.e. to link text extracted from a scanned receipt to the COICOP classification. EAN/GTIN descriptions are a by-product of shop scanner data and concern the descriptions as being used by the shops. Typically, these are linked on a continuous basis to COICOP categories. This means that classification amounts to matching texts on receipts to product descriptions, which is much easier than matching to COICOP in one single step.
* NEW What about scanning of very long receipts? There obviously is an upper limit to the length of a receipt as the number of pixels per symbol will become too small. We foresee two solutions: 1) select only the part of the receipt where products and prices are listed using the in-app overlay, 2) break the receipt into two or more pieces and remove overlapping products that appear twice. In follow-up development we will try and patch pieces of long receipts, but this will be not available before phase 3.
* NEW Do the household see immediately the text recognition in the app? We are not yet sure. Machine learning models that we are testing take around five to ten seconds. This seems doable and we are preparing an animation for the respondent while he/she is waiting. The classification will not take place in-app and demands for Wi-Fi. As a consequence a scan has three types: scanned and awaiting classification, classified and awaiting validation by the respondent, and validated.
* NEW Possible to scan also bills of restaurants? In principle yes, but question is whether they should be. Scanning only is favorable when it reduces respondent effort. A restaurant bill may be just one item to enter in the diary.
* NEW Apparently the mobile app is meant to use a “respondent specific” backend server, how is this thought to be configured? Is the backend server configured when deploying the mobile app? This kind of function doesn't seem to exist in the app yet? App and backend are two independent programs. One would need to deploy them both to have data transport from respondents to the NSI. They communicate via RESTful API. At this moment the URL to the backend is hardcoded in the HBS-app. We will have to adapt the URL for other counties. The URL string will be determined upon entry of the HBS-app when the user chooses the country. For this purpose each country will have to provide their own URL.
* NEW The backend server software is made with GO. A desirable next step would be to package the backend software into a docker container so it is easily deployable. Is this possible? That would be a great idea. We can help with that.
* NEW How is the user management thought to be handled? Beforehand or do respondents register themselves? Everybody can download the app, but only selected users will have a username/password/QR-code to use the app and talk to the backend. One way or another, the user’s credentials have to end up in the database connected to the backend. How they get there is up to the NSI’s. A simple script would be able to do that.
* NEW Is the idea that the data is transferred from the database of the backend server to the client's own environment, or are there any ready tools for us to use for this? Every NSI has different workflows, pipelines, etc. It is thus not possible to offer a generic solution. One can either directly query the backend-database, sync it with a second one somewhere else, or make (CSV) exports and copy them over. The possible approaches depend on the infrastructure in place, but we could give advices if we know more about the current setup.

App frontend:

* What adaptations can be made to the app UI?: Within the ESSnet, the only adaptations are in NSI logo and language (and possibly colour scheme). All app source code is open and the NIS may decide to include other changes.
* What options do respondents have to check/revise receipt classification?: The classified receipts will be included in the overview of purchases with an orange flag, indicating that the respondent needs to validate. The editing of the classified receipt is done in the same way as for manual entry with a few small changes.
* When will the app be ready in the country language?: This depends on the NSI. The app UI language should be ready by May or June. The product lists and shop lists depend on the NSI. These can be altered relatively quickly.
* Can questions/variables be added to the UI?: No, not during the ESSnet. However, app source code is available and can be modified.
* How to include discount/rebate?: In the two @HBS test rounds, this feature turned out to be one of the hardest data entry elements. We have not yet found a satisfactory solution. This may still be gradually improved during the ESSnet. Any input is welcomed.
* How do you code the shop/service types take away, kiosk, canteen to COICOP? In principle, the link of shop types to COICOP is only to serve respondent statistics. The actual classification of products is independent of this and is based on the products that respondents enter.
* Can more than one product type be linked to scanned receipts?: No, but the question is whether it is needed, because the link is used only to classify receipts for the respondent statistics overview.
* Will there be a background/recruitment survey in-app?: Yes, the intention is to have a rudimentary recruitment survey. The content still needs to be decided during the WP2.1 project meetings.
* Can quantities (liter, kilogram, etc) be added to purchased products?: Some ESS countries ask respondent to report quantities of products. This is not a mandatory part of the HBS and not included in the HBS app. It will be added as an optional TO DO feature. It will not be very hard to add it to the UI, but metrics are country-dependent and receipts may not always carry the information.
* Can country of purchase be more detailed than yes/no purchase abroad, e.g. identifying the neighboring countries as categories and an “other countries” category?: This is possible and not complicated in the UI as long as the number of countries is small. It will be added as a optional TO DO feature.
* Can the incentives scheme be deleted from the app calendar screen?: Yes, this can be altered or removed.
* Can household members enter only their own purchases?: Yes, this is possible. All household members can register on their own device(s) and provide only their own purchases. When registering the app, they are asked to provide a name, which will be kept. Rules/procedures may follow current paper or online diary keeping. However, the app will not anonymize or hide expenditures from one household member to the other, nor make individual statistical overviews. All household expenditures are pooled. The only alternative would be separate logins per member.
* Can expenditures be made recurrent, e.g. each day a take away coffee or train ticket?: In an early version of the app, this option indeed existed, but was removed as it was feared that respondents would forget when they deviate from this. Such recurrent items may be added for larger expenditures, but is an open methodological questions.
* NEW Does the app need to be running in the background? At this stage, this is not necessary as there are no background processes that require continuous updating. It can be closed after each series of data entry.
* NEW Why is it possible to enter purchases in the future? This can be removed if desired. It was originally included because respondents may have recurrent purchases.
* NEW Will there be edit rules implemented to control entry of prices? Although it is a good idea, such rules are not easily included. One reason is that the rules will have to be product dependent, which requires a careful designing of the product lists. The second reason is that products can be entered without specifying the quantity. The app does sum up all prices to an overall price, which could be offered to the respondent as a check.
* NEW If we add a new product which is not in the list, we can categorize it. However, we can only choose between some default categories and not all categories. One of those default categories is Additional, which always appear. If a respondent choose that Additional category, is it then revised or is it added to group 12 Other goods and services? We have not yet decided how to deal with ‘unknown’ products. We anticipate that they will be reviewed manually. The Dutch list is around 29000 items and has evolved in this way over time.
* NEW If a product appears in the list, we can still add it as a new product and categorize it again. Will these categorizations be reviewed? This means the respondent is either not willing to use our classification or the product search did not show the product. The latter is most likely and may occur for example due to typos or abbreviations. We have not decided what to do, but we expect that all newly entered products will go through a manual review.
* NEW Can the algorithms underlying to the presentation of product search results be adapted? Currently, the app uses the Jaro-Winkler search algorithm which has a few parameters that can be tuned. It gives higher weight to words where the first part of the word is the same. A well-known alternative algorithm is the Levenshtein algorithm that gives equal weight to all symbols. We would like to propose ESTAT to further optimize search algorithms in a follow-up innovation grant.
* NEW 2. If we take a photo of a receipt, we can choose one of the 12 ECOICOP groups but only one. Could it be possible to choose more than one? This part needs some extra explanation. The type is added because we like to link the receipt to respondent statistics. As soon as the receipt is classified this will overrule the specified type. It must thus be seen as a temporary classification that is not of much use to the NSI. Since it plays a relatively minor role, it was not deemed necessary to allow for a more subtle classification.
* NEW Could it be possible to collect not only monetary expenses but also not monetary expenses; that is, self-consumption, self-supply and wages paid in kind? These are not mandatory HBS output, but they are part of many national supplements to the HBS. It can be discussed at a TF HBS whether it is desirable to add as a type of product.

Fieldwork/administration:

* Who will collect data during basis tests, usability tests and field test?: See the app backend. During the ESSnet data are collected, stored and processed at Stat Netherlands. The app can be disconnected from the backend during basic tests and/or usability tests.
* How will the helpdesk operate during the field test?: There are two helpdesk options: Email address and phone number. Both can be tailored to the country. The email address is the most convenient as it includes information on the userID in order to facilitate error diagnostics. The telephone helpdesk should most likely be limited to recording issues and forwarding these to the internal or external helpdesk. In advance, we will prepare a list of the most common errors and questions and prepare standard answers. These will be provided to the countries in English. Given that data collection is at Stat NL, it is inevitable that some errors/issues need to be checked by NL staff. We need to discuss with the countries whether additional training of telephone helpdesk staff is desirable.
* How are login credentials organized? And what about household members?: Login credentials are created at CBS and provided by the NSI to the sample. All households will receive a unique login. We will not create logins for each household member. However, household members can secure the app through a personal password. It is important to remark that we will not confidentialize purchases within households.
* Need usability tests be performed according to certain specifications?: For the two test rounds in project @HBS, test protocols have been developed. These are made available to WP2.1 countries and may assist in testing. One recommendation is to distinguish two groups, one group that is monitored while installing and opening the app and one that has to perform these tasks by themselves. Since it is not assumed that detailed usability tests are conducted, the format of the country tests is left open and to be decided by countries.
* NEW Do you create one login for each household? In Luxembourg each household has a number. Would it be possible to use this number as identification number to the app? There will be one login per household consisting of a user name and a password. The usernames can be provided by the NSI and the password is generated by the app backend.

Further development app outside ESSnet:

* Who is system owner of the HBS app? How will further development be organized?: Stat Netherlands for now is system owner, but all source code will be made open. It still is an open discussion with ESTAT how to organize governance. It is not the aim of Stat NL to own the tool indefinitely, but we will assist in revisions. It is very likely that Stat NL in a consortium yet to be formed will submit additional applications for funding at ESTAT innovation calls for HBS-TUS. Each NSI will be invited to participate in such a consortium. Under the ESSnet, no explicit funding is included to further develop app functionality.
* What further development is needed? Within @HBS this question has been discussed a number of times> Four topics come up: 1) Further refinement of the receipt scan pipeline, 2) consent and linkage to big data (such as bank transactions, loyalty card data, iCards), 3) multi-device data collection, and 4) user-centered approach (product lists, shop lists).
* Can we get assistance if we decide to further develop the app ourselves?: To some extent. Depends on the ambition. This could be a part of future follow-up grants.

Analysis:

* What contribution is needed from us in the analyses?: Strictly speaking all analyses can be done without in-depth assistance from the NSI’s. However, review/collaboration is welcomed. At the intermediate WP2 meeting in October, analysis plans will be presented and discussed. Country-specific analyses can be conducted (accounting for the sample size per country).
* NEW Are data collected during the tests and field tests available? See also the first question under App backend. Data will be made available. For the tests, it can be decided to disconnect the backend. For the field test, data exchange still needs to be discussed in detail.