

COOPERATION ON MULTI-MODE DATA COLLECTION (MMDC)
MIXED MODE DESIGNS FOR SOCIAL SURVEYS - MIMOD

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WP3 - Deliverable 4

In-depth expert interviews on data collection systems in practice

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Technical solutions to the challenges of running mixed-mode surveys

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WP3: Case management in MMDC and related data logistics

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Introduction

Complex mixed-mode surveys challenge traditional data collection systems mainly in the following areas: questionnaire production, case management and communication with cases. To give deeper insights on this, this report will describe the main processes within each of these areas of data collection that cause a challenge to the technical system.

Based on interview data of experts of 14 different NSIs, the most needed technical features to tackle the challenges are presented. Special focus is given to the way countries have implemented these technical features in their newly developed data collection systems. It will be shown that within each of the areas “questionnaire production”, “case management” and “communication with cases”, although there are sometimes very different approaches in some countries, there seems to be common needs in most of the main issues about data collection and an overall trend towards similar technical solutions.

Methods

The data of this report is based on the interview data of the interviewed NSIs of WP3: deliverable 3. To enrich this data, two additional experts, one on data collection at Istat (Italy) and one on business/ software architecture at CBS (The Netherlands) were interviewed via telephone. Also a study visit to SBS (Norway), meeting the experts on questionnaire production, fieldwork management and survey methodology, was undertaken. Furthermore, all written answers that were received via email (France, Sweden, Lithuania) were added to the data basis. All in all, this report is based on information about the following 14 NSIs:

Table 1: Net sample of consulted NSIs

NSI	Data Collection System Type ¹				Newly Developed System?	Data collected via
Austria	I1	S1	C1	T2	Yes, currently developing	Personal Int.
Czech Republic	I3	S1	C1	T3	Yes, currently developing	Telephone Int.
Finland	I2	S2	C1	T1	Yes, currently developing	Telephone Int.
Hungary	I3	S3	C2	T3	In planning, currently concept phase	Telephone Int.
Latvia	I1	S1	C1	T1	No, old system well established	Telephone Int.
Luxembourg	? (based on survey)				Yes, finished	Telephone Int.
Poland	I1	S1	C1	T1	Yes, currently developing	Telephone Int.
Portugal	I1	S1	C1	T1	No, old system well established	Telephone Int.
Norway	I2	S2	C1	T4	Yes, currently developing	Study Visit
Italy	I2	S2	C1	T4	Yes, currently developing	Telephone Int.
Netherlands	I2	S2	C1	T2	Yes, currently developing	Telephone Int.
France	I3	S5	C1	T3	Yes, currently developing	Email
Sweden	I4	S5	C1	T2	In planning, currently concept phase	Email
Lithuania	I1	S1	C2	T2	Yes, finished	Email

¹ The type of data collection system as suggested by the MIMOD survey. For a description, please see data collection system typology in Annex 1 on page 24.

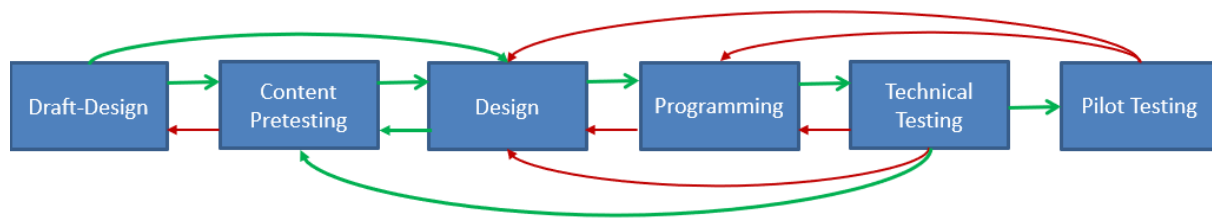
For the analysis procedure, please refer to WP3 deliverable 3, pg. 3.

Survey Instrument Production

The Process of Questionnaire Production

In general, questionnaire production within the interviewed NSIs is done in six steps. It begins with the draft-design, mostly in external tools like Excel/ Word and ends with the fully programmed and thoroughly tested electronic version of the questionnaire.

Figure 1: Process of questionnaire production



In practice, the above pictured process of questionnaire production is not linearly progressing one step to the next. Instead, all interviewed countries reported that questionnaire production is to be seen as a looping process. Very often, after accomplishing one step, you need to go back to the previous step, sometimes even further back. For example, during the step “Programming the questionnaire into the electronic questionnaire tool” you find the need to adapt some routing logics of the questionnaire. In order to do so, you have to go back to the design step, adapt the routings and then start programming them anew. In the above graph, the green arrows therefore represent common ways of proceeding to the next step, whereas the red arrows represent frequent loops back to previous steps.

In the interviews, it became clear that there are two critical phases within the questionnaire production process where most of the back-and-forth-looping takes place. One is between the steps “Design” <-> “Programming” <-> “Technical Testing”. The other takes place only at those NSIs that invest in forms of content pretesting. Then there is also a major loop phase between the steps “Draft Design” <-> “Content Pretesting” <-> “Design”.

A modern data collection system technically supports every step of the questionnaire production process and takes special attention to the fact that there are loops between the steps. Considering the above-mentioned major looping phases, the data collection system should provide one or multiple interlinked components that bring together the steps draft-design, design, programming and testing. How this is being achieved in newly developed systems will be illustrated in the next chapter.

Questionnaire Production in “new” systems

Questionnaire Production Component

Although the interviewed NSIs use different tools for questionnaire production (BLAISE, in-house developed, outsourced at private companies) all of them need to be programmed by rather complicated IT-syntax. This is interesting, because in private sectors of online questionnaire tools, almost all of them can be “programmed” by the use of very user-friendly design tools. With these tools, everyone may design and program an electronic questionnaire without special IT knowledge. But, even in the latest version of Blaise (Blaise 5) programming the questionnaire still relies on manually complex programming Blaise code. This has the advantage that there are almost no limits in the possibilities of programming the questionnaire. An experienced programmer is very flexible to fulfill any special need of the design team. Another advantage is to easily do mass changes, for example change the routing condition “older than 17 years” to “older than 15 years” for many questions at once.

However, this approach bears the following drawbacks:

- Because it is too complicated to learn the programming for the questionnaire design team (who are mostly working in the subject matter units) often other staff, mostly from the IT-department has to get involved in the process of questionnaire production. This makes it labor intensive and prone to errors.
- After programming, changes to design take long and are complicated. In many countries after a later change in design, the design team has to contact the programming team, explain the change, then has to retest the new version, if an error is found has to contact the programmer again and so on.
- The designed version (mostly in Word or Excel) and the programmed version get out of synch in the process of programming-testing-programming.
- There is little possibility of interaction with other surveys. The questions get programmed for every survey independently. The sharing of knowledge and experiences is at a minimum.
- There is no general overview over which questions are used in which surveys
- There is no automatic version control that documents the change of questions during the data collection waves.

Especially in mixed-mode surveys, where the questionnaire must function in multiple modes and therefore must be programmed and tested most intensively, these drawbacks amount to high efficiency losses. To counter these disadvantages two of the interviewed NSIs that are using BLAISE as their questionnaire tool and two NSIs that are using an in-house developed questionnaire tool have integrated an additional component within their system: they have acquired or developed a component for questionnaire production, that brings together the steps of design and programming. What these questionnaire production components all share is a user-friendly graphical point-and-click approach. In these components, there is no need of manually programming the questionnaire anymore. In one country, even the step “testing” was

successfully included in the questionnaire production component. This best practice will be presented in detail in the final report.

All of the observed four questionnaire production components have a function for exporting the questionnaire's metadata. This metadata file then can be imported – in one country even transferred with the click of a button – into the actual questionnaire component. Doing so, the questionnaire is brought to life, and becomes ready for data collection.

Questionnaire's Metadata

Two of the interviewed NSIs rely on standardization for their questionnaire's metadata: they make use of the DDI standard¹. Using a questionnaire metadata standard seems to be a promising approach, as it will enable them to easier adapt further external add-on tools, for example a questionnaire documentation tool, a question bank or metadata admins for statistical warehouses. Also, it could make the exchange of the questionnaire tool easier in future, if also the questionnaire tools themselves start to pick up DDI as the standard for importing questionnaires into their system. To our knowledge, Blaise for example, is working towards that direction. But which metadata standard is most promising for the future? Within the ESS there is discussion about metadata specialized for the GSIM model or a further development of SDMX. One strong advantage of the DDI standard is its use academia surveys. Most definite, a new questionnaire metadata standard for NSIs must also be used in the world outside of official statistics, in order to allow for the integration of external open-source or private-company tools. ESS Projects investigating this topic further could therefore be of high value.

Question Banks

Some interviewed countries also have question banks included in their questionnaire production component. With the help of question banks certain or all questions of the questionnaire are stored in a library. The library is survey independent, which allows for the reuse of one specific question in multiple surveys. Using question banks serves the need for harmonization between surveys, overview of used questions and version control.

¹ See <https://www.ddialliance.org/>

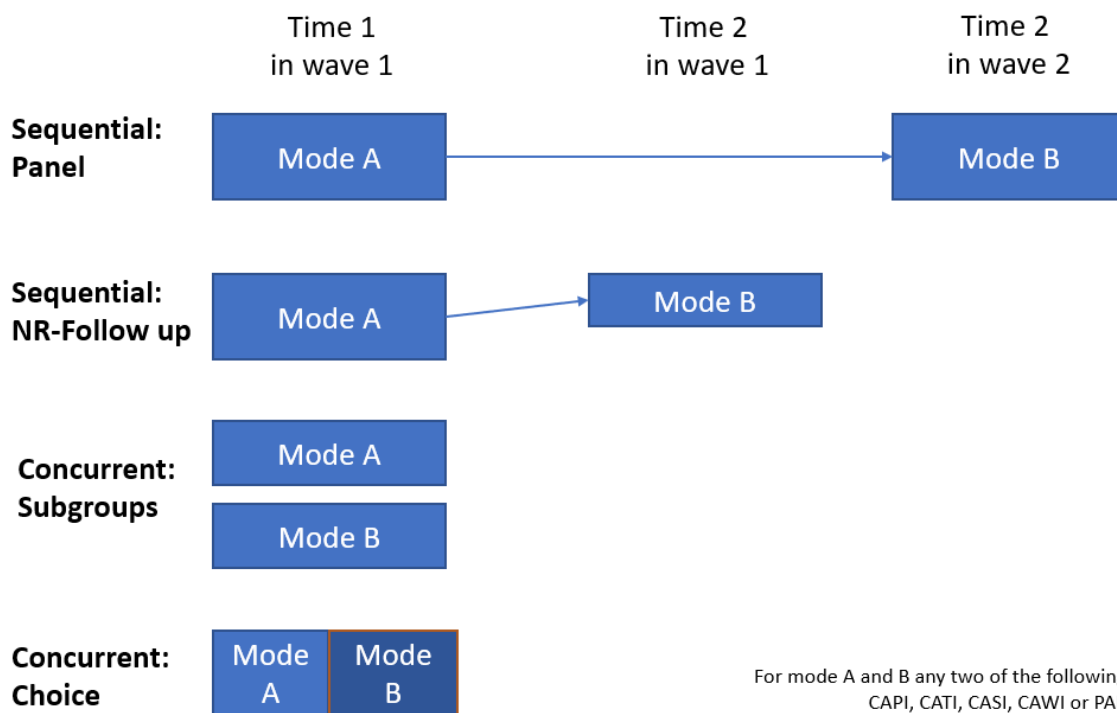
Case Management

The Process of Case to Mode Assignment

Case to Mode Assignment by Mixed-Mode Design Types

To better understand the process of case to mode assignment it is helpful to look at the way it was done in the “old” data collection systems. In these “old” systems, mixing mode meant moving sampled cases from one mode system to another mode system. Based on the interviewed NSIs, for one specific survey, the movement of cases between the mode systems can be done in one of the following ways:

Figure 2: Movement of cases per mixed-mode design type



In a **sequential panel design**, all the sampled cases of the survey are at first in the questionnaire system of mode A. For example, in wave 1 all cases of the LFS survey are in mode CAPI. Data is being collected in CAPI until field phase of wave 1 ends. Then, say three months later, data collection of wave 2 starts. This time, all of the cases of wave 1 are interviewed in another mode, CATI for example. For this, the cases are transferred between wave 1 and wave 2 from the CAPI system into the CATI system. In the traditional data collection systems this transferring of cases was done manually by exporting cases from the first mode’s system and then importing them again into the second mode’s system. Because the field phases of the different waves are

independent from one another, the necessary flow of information between the two mode systems is rather minimal.

In a **sequential nonresponse follow up design**, again all the sampled cases of the survey are at first in the questionnaire system of mode A. In contrast to the panel design, they are moved to another mode's system within the same field phase. For example, all cases of the HIS survey are in mode CATI in the beginning. Data is being collected in CATI until a certain end-of CATI data collection criteria is reached, say 4 weeks are over. Then, all cases that have not yet completed the questionnaire or have set a fixed CATI interview appointment are switched to mode CAPI. For this, all these so far nonresponse-cases are transferred from the CATI system into the CAPI system. In the traditional data collection systems, this transferring of cases was done manually exporting all cases from the first mode's system, then manually selecting only the needed non-completed cases, and importing them again into the second mode's system. Even though the data collection episodes of the two modes are still sequential, there are more information to be transferred per case between the two mode's system and they have to be transferred in a tighter time schedule than in a panel design.

In a **concurrent subgroup design**, the sampled cases are split into groups per mode already at the beginning of the field phase. Data collection then runs for each group of cases in the different modes at the same time. For example, at EU-SILC wave 2, one group of cases is loaded into the CATI data collection system and another group of cases is loaded into the CAPI data collection system. The decision which case is to be put in which group is decided beforehand based on characteristics of the cases such as availability of correct telephone numbers. Field phase then runs for both groups simultaneously. Because of the parallel running of data collection, field phase quality indicators of the different mode's systems, such as response rates, have to be summed up at one central place in order to get the complete picture of the survey's current status. Also, the central field unit staff responsible for the survey must have an easy way of accessing the case's information regardless of mode system, because at any given time it could be necessary to know in detail about a case in mode A or B. The needed flow of information between the mode's system is therefore rather high.

In a **concurrent choice design**, also two or more mode's data collections run at the same time but the sampled cases are not divided into subgroups beforehand, rather they can freely choose which mode they want to participate right at the start of data collection. For example, in LFS wave 2, the interviewer, who is able to do CATI or CAPI, contacts a respondent ("case") and let the respondent choose the mode of interview. The interview then may immediately start in the chosen mode of data collection. In traditional systems, in order to technically accomplish this, it was necessary to load the same case in both questionnaire systems. If the case completed data

collection in one mode, you had to very promptly manually remove it from the other mode's system in order to prevent double data. The needed flow of information is as high as in the concurrent subgroup design, but because of the double risk, time pressure is even higher.

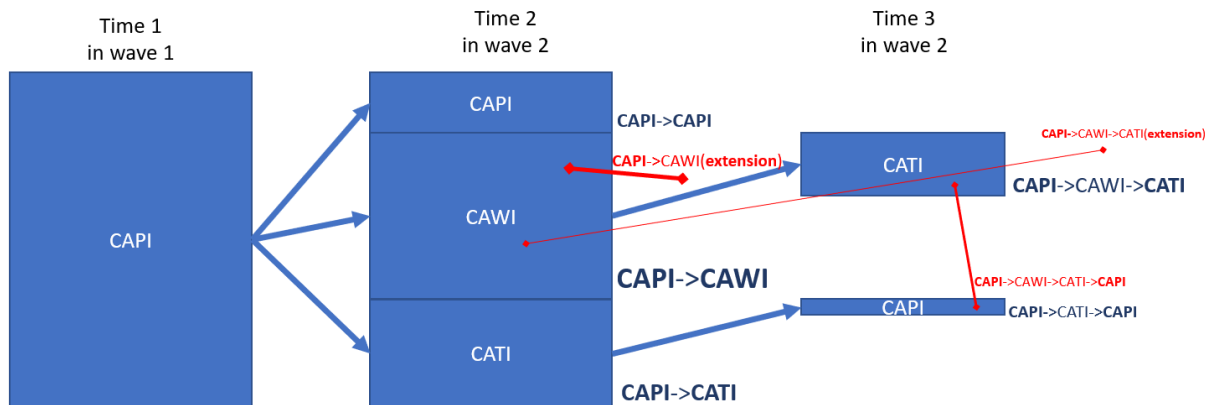
A fifth type of design was mentioned in the interviewed NSIs as a crucial element in modern mixed-mode surveys, namely **adaptive design**. For survey methodologists the term adaptive design is rather ambiguous, but most definitions share the following “four key elements: auxiliary data, design features/interventions, explicit quality and cost metrics, and quality-cost optimization” (Asaph YC et al. 2017, pg. 572). In this context of practical case management, adaptive design is best described as the interaction between auxiliary data and design features, used to identify subgroups and match – adaptively during field phase - different data collection procedures to each group in order to improve quality or reduce cost (see *ibid.*). In WP1 deliverable 2, this approach and possible methods in practice are described in detail. In terms of case to mode assignment, adaptive design means that within one survey different cases might have different mixed-mode designs. For example one group of cases will be run in non-response follow up design CAWI -> CAPI whereas another group of cases might run in CAPI-> CAWI. But there could be even a third group, not running in non-response follow up design but in the concurrent choice design “please choose: CAWI or CAPI”.

Finally, **responsive design** must not be forgotten. In the opinion of the interviewed survey managers, responsive design should be seen as a general rule for all data collections. To them it means a flexibility in the way of working. During field phase, you must always react to circumstances that were not planned. For example, some cases in a certain region that were planned for mode CAPI cannot be reached by the interviewer due to heavy snowfall. This demands for an immediate reaction to the survey plan: To name just two possibilities out of many, the survey design could now be changed so that these cases get more time for completing the CAPI interviews and an email is sent informing them about the new deadline. Or they could be switched to another mode, for example CATI or CAWI. In any way, the change of plan must happen very quickly, as the cases, interviewers and the subject matter team start nervously calling in. So responsive design in practice means, to do something new to your planned design, either for individual cases or specific groups of cases. For that, a highly flexible data collection system is needed. It must allow for these kinds of changes at any time. But sometimes the needed flexibility is constrained by the technical system of data collection, which is rigidly forcing survey managers to stay on the original path of data collection against better knowledge.

Case to mode assignment when mixing mixed-mode design types

In reality, a modern mixed-mode survey for official statistics now combines the above-mentioned designs into an highly complex mix of mixed-mode designs. For example, in the Austrian Pilot for a new mixed-mode design of the LFS, the survey design looks as follows:

Figure 3: Mixing mixed-mode design types in the Austrian LFS Pilot 18/19²



In wave 1 all respondents are asked via mode CAPI. Based on data collected in wave 1 (such as data about internet access, email-address, telephone number) the respondents are split into subgroups for wave 2. Most are pushed to CAWI, some to CATI and a few may continue with mode CAPI. So, two designs types are mixed here: the sequential panel design between these waves and the concurrent subgroup design within wave 2. As the story of data collection continues, there is even a third design type mixing in, namely sequential non-response follow up. That is, the non-respondents of CAWI are automatically switched to mode CATI if they do not react after a certain period of time. Likewise, the non-respondents of CATI are switched to CAPI. Finally, there will always be some few individual cases, that have the need for a detour of the survey plan, like an extension of data collection period in mode CAWI or a mode switch to CATI. To accompany for that, a simple form of adaptive design is being used. Altogether the Pilot therefore is mixing 4 out of the 5 design types. Such complex survey designs can be seen as a stress test for every data collection system. So how are newly developed data collection systems set up in order to handle these kinds of case to mode assignments? The next chapter will give an overview.

² The Pilot tests one possible survey design and four communication strategies for the potential Austrian LFS (newly including CAWI). Please note, that the final survey design is still to be defined, depending on the outcome of this pilot.

Case to mode assignment in “new” systems

Based on the interviews, the key components for assigning cases to modes are central case administration and the execution of survey plans with the flexibility for individual case treatment within modes. In the interviewed NSIs, that have a newly developed system, all except one made the decision to technically centralize the case administration. The usage of a predefined survey plan that is executed automatically by the system is or will be implemented by most of the interviewed NSIs with newly developed systems. But note, some NSIs achieve case management without such an automated survey plan. The within mode flexibility for case management is implemented by all interviewed countries. In the following chapters these components will be described in detail.

Central Case Administration

Having a central case administration, that is a central place where all the sample cases are stored and their main data comes together, seems to be the key element of “new” data collection systems. In the “old” systems each case was stored within each mode’s system and the cases and their information had to be moved from one mode to another as described on page 8ff. Interviewed countries with such decentralized case administration are either not (yet) running very complex mixed-mode surveys or have the data collection fully outsourced. The one interviewed country, that has developed a new system for more complex surveys but still uses this decentralized approach reported so heavy technical problems that they now consider case management as missing in their new system. All other interviewed NSIs with a new system have the case administration centralized. This hints towards the thesis that, in order to efficiently run complex mixed-mode surveys, the case administration needs to be technically centralized.

Panel perspective

One challenge to the central case administration is the fact that some surveys are run as panels. This puts case administration in a whole new perspective: for example, a panel of two yearly data collection waves, one specific case has to be managed within wave 1, between wave 1 and wave 2 and within wave 2. To the case administration component, the following needs arise from this:

Firstly, it must allow for one case to be in more than one survey (if each wave is technically designed as its own survey or sub-survey). In one of the interviewed countries with a newly developed case admin, the cases are not technically stored in this 1 case, n surveys relationship. Instead, the cases are simply copied from one wave to the other. The country reported of efficiency problems when changing a case’s masterdata and when monitoring cases across waves.

Secondly, the central case administration must allow for possibilities to manage the cases between the waves. For example, when a case calls in and announces a change of names after

wave 1 but before wave 2. The time between the waves can sometimes even actively be used by the NSI to stay in the minds of the cases and/or ask for data updates. For example, in one country Christmas cards are sent out to the panel respondents between the waves. As a supplement to this, respondents can send a letter back to the NSI if their contact data had changed. The updates to the contact data are then made manually by staff of the data collection unit, but within the system's central case administration component.

Thinking this approach further towards a more CAWI-oriented data collection, it might be very useful in the future to offer an online respondent portal where the cases can overview their surveys and manage their contact data themselves. Changes could then be automatically processed by the system. Of the interviewed countries, no system seems to have such a portal yet but in some NSIs this is already being discussed, also in the context of business surveys where cases often must participate in multiple different surveys.

Masterdata

The first step in case administration is to design the sample of cases. That is, the cases are defined - mostly in Word or Excel - before the sample is actually created and imported into the system. By defining the sample, it is made clear which masterdata is provided per case. Based on the interviewed countries, there seem to be three kinds of masterdata: (1) characteristics that are used by every survey, such as "street name, house number and zip-code", (2) characteristics that are used by some surveys but not by others, such as "email-address" or "Start Date of reference period" and (3) characteristics that are unique to one specific survey, such as "Experiment Group A". For designing the sample, it is necessary to define which of the masterdata of type 2 and 3 should be used. For example, it is specified that the characteristic "Start Date of reference period" will be used. Next, the rule for how to assign a value to each case must be stated. In this example, the rule could be: "the value is either 01.02.2019 or 08.02.2019. Assign these values equally to the cases per random function." Based on that rule, a sample can be generated so that half of the cases will randomly have 01.02.2019 as their "start date of reference period" and the other half 08.02.2019.

Based on the design of the sample, the samples are created and imported into the data collection system. Unfortunately, no insights on this process and how it is technically achieved were gained during the interviews. But design of a sample, sample creation and sample import could also be components to take in focus when trying to make data collection systems more efficient.

In order to store and display the imported masterdata of type 1 and 2 in a structured way, the central case administration must offer a fixed set of characteristics across all surveys. But it must also allow for survey unique masterdata of type 3 (survey specific characteristics) to be stored and display. The latter seems to be a challenge for centralized case administration: One country reported not to have the flexibility for survey specific characteristics in their system. This causes them to find workarounds, that mean manual work and potential error sources.

Statusdata

Besides these masterdata, it seems to be essential to integrate statusdata for each case in the central case administration. Statusdata is data, that informs about the current state of a case in terms of fieldwork progress. The most important statusdata are final disposition codes and temporary contact codes. Final disposition codes record the outcome of data collection such as “Interview Complete”, “No contact”, “Refusal” and so on. Temporary contact codes record the outcome of any contact within data collection such as “Called R, but line busy”, “Visited address but no contact”, “Interview appointment set” and so on.

These statusdata guide the process of data collection in a critical way. Based on the statusdata, response rates are calculated, and the current status of the whole survey is monitored. Furthermore, the next fieldwork action per case or group of cases are chosen based on statusdata. For example, all cases with disposition code “No contact” are switched to another mode. Or all cases that have for 3 consecutive times the temporary contact code “Called R, but not answered” are next called at a very different time of the day. Because statusdata guide the case’s course through the data collection process, they are a crucial element in case management. For that reason, every interviewed country is trying to standardize statusdata within their data collection system.

Only by standardization statusdata between surveys and modes, the automatic execution of fieldwork actions is made possible. But to find a well set of disposition and temporary contact codes is a very demanding task, especially when taking into account all modes. In the interviews, two countries reported the need for more resources to accomplish this task thoroughly. In academia and market research, special attention to such disposition codes are given in order to standardize response rates between surveys and make quality of field work comparable (see The American Association for Public Opinion Research, 2016). But to our knowledge no recent guidelines or projects on this topic exist within the ESS. Having a more standardized approach on disposition codes within the ESS would not only help to compare response rates but also help to save resources in the development of data collection systems. As the statusdata transferred between the components would be more harmonized, it would also help to assist the exchange of certain components between NSIs. Furthermore, it would help to compare results on best data collection strategies and find common best practices depending on the disposition or contact code of one case.

Event diary

The third type of data to be stored within the central case administration is event history data. Many interviewed countries mentioned, that for fieldwork it is crucial to know in detail the past events per case. For example, fieldwork events of a specific case could be the following:

“Fieldwork starts by sending an announcement letter. Next, a contact is tried by the CAPI interviewer, which was unsuccessful. But the interviewer leaves a note at the door of the household, asking for a call back to set an interview appointment. This worked, the case calls the interviewer and sets an appointment for the weekend. On weekend, the interviewer meets with the case and can complete the interview. On Monday, the thank you letter with the incentive is sent out by the system. But one week later, the case calls the hotline and asks about when it will receive the incentive.”

At that point, the hotline staff immediately needs to see the case’s past events. In modern data collection systems, the events are presented in a structured diary. It is important, that the diary is presented in a very user friendly form, enabling staff members to quickly grasp the case’s situation. Such structured diary could look like in the following table:

Table 2: Possible way of presenting an event diary

Event	Who	When	Detail
Sending letter: Announcement letter	Outbound Communication tool	02.02.2019 08:20	Letter template ID “A1”
CAPI contacts R: No contact	CAPI Interviewer ID 453	08.02.2019 16:05	Comment: “No one opened the door. Left a note at the door to call me back”
R contacts CAPI: Interview appointment set	CAPI Interviewer ID 453	08.02.2019 18:22	Interview appointment set for 10.02.2019 12:30 Comment: “R only has time between 12:30 and 13:30”
Interview completed in CAPI	CAPI Interviewer ID 453	10.02.2019 12:58	Disposition Code: Completed

Sending letter: Thank you letter	Outbound Communication tool	12.02.2019 08:00	Letter template ID "T2"
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With the information of the diary, the hotline staff can now answer the case's question. In this example, the story could continue as follows: "case and hotline agree on the fact, that the incentive has already been sent out, and it should arrive within the next days. They agree that the case should call in again in a week if it still has not received the incentive". Of course, this event also must be protocolled by the hotline staff. Doing so, the event diary gains a new row:

R contacts Hotline: Clarification	Hotline Staff ID 3	20.02.2019 08:45	Comment: "Incentive not yet received. Probably postal service takes longer than normal. R will call again in a week if still no incentive received"
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About half of the interviewed countries reported to have some kind of event diary. How they are technically implemented in the case administration system needs to be further investigated. But it became clear that in order to efficiently run mixed-mode surveys the case diary must be able to collect events in a standardized way, regardless from which mode or component the event is triggered.

Synchronisation of data

In regards to the update of the case's masterdata, statusdata and event diary data, it is important to note that it may occur at any time during the data collection process. Also, updates are initiated by different components: before a wave by the component "sample import". During a wave by components like the "questionnaire", the "within-mode case management" or the "outbound communication". And between the waves by the component "inbound communication". A key aspect of the whole data collection system therefore is to make it possible that all components may send update information to the central case administration and that this info is being handled automatically by the central case administration. In the best of all systems, this transfer of information is done live. Special attention needs to be given for the mode CAPI as all interviewed countries report that even with very good internet infrastructure in the country, CAPI still needs to be offered as an offline mode.

Searching for cases

Another key feature of the central case administration was mentioned during the interview, namely the function for searching cases. Such a search for cases function must take into account the following needs:

Firstly, personnel needs to search for a specific case by its name, address or another characteristic. Because there are many different characteristics possible, it is most efficient if the user may type in the search term in one single search field, and the system searches for cases with this search term in any of the possible characteristics. In one of the interviewed countries, fieldwork staff reported, that their search tool does not incorporate masterdata of type 3 (survey specific characteristics) which made it burdensome to search for some cases.

Secondly, personnel needs to search for a group of cases. To accomplish this, the search tool needs to allow for a user-friendly way of building searches that logically combine a set of characteristics. For example, “Search for all cases in mode CAWI, that have received reminder email 2 and are still incomplete”.

Thirdly, there is the need to have the results of the search listed very fast. Waiting for the results even 5 seconds or more sums up to a subjective experienced tremendous waiting time, considering the many times fieldwork staff needs to use the case search throughout their work day. In one of the interviewed countries, fieldwork staff was very unhappy with the long duration of the search engine and it took quite a lot of IT resources to correct for this.

Automated execution of survey plans

Pre-defined survey plans

It is striking that most of the newest data collection systems are striving towards a pre-defined survey plan that is executed automatically. A survey plan specifies all main fieldwork actions on a general level. For example:

1. Send an invitation letter to all cases on 01.02.2019
2. Start data collection in mode CAWI for all cases on 01.02.2019
3. Send reminder email only to those cases that do not have disposition code “Complete” on 07.02.2019.
4. Start data collection in mode CATI only for those cases that do not have disposition code “Complete” on 14.02.2019.
5. Send thank you email as soon as disposition code “Complete” is set.

Of course, the more complex the mixed-mode designs get, the more complex this survey plan gets. For that reason, the newest developed data collection systems of the interviewed countries all try to integrate the survey plan into their system. Two countries already accomplished this. In their systems, the survey plan is designed before data collection starts by certain survey plan design tools. During data collection, the system automatically initiates and executes the right fieldwork actions for the right cases at the right time, based on the survey plan. There is almost no manual work needed during field phase for switching the cases to a

certain mode or sending written communication anymore. Of course, manual work remains for the design and testing of the survey plan, and for individual case treatment. It is important to note that the system must still allow for individual or group case adaptations of the survey plan, see the following chapter. Nevertheless, these systems seem to run data collection very efficiently and they can manage even very complex designs such as the one described on page 11.

Among the interviewed countries, there were systems that did not have automated survey plans. Mostly, these countries do not run complex mixed-mode designs. At first glance, one could assume that they do not need automated survey plans. This needs further discussion, as it is unclear if they are not running complex survey designs because their system does not enable them to do so efficiently. It may be that, with the implementation of an automated survey plan, the usage of more complex survey design rises. Such causality was experienced in one NSI within a few years after the implementation of the new automated data collection system.

Finally, there are two countries out of the interviewed, that have found a totally different approach to the execution of fieldwork actions. In their systems, they “outsource” the fieldwork actions to their interviewers. For example, in one of these countries the survey plan is kept to a very minimum: to have the first contact in CAPI and to only use PAPI when absolutely necessary. The NSI then leaves it in the responsibility of the interviewers which mode switch they do at which time (interviewers can interview in CATI or CAPI) and which kind of communication are sent at which time. What the advantages and disadvantages of this approach, compared to the pre-defined survey plan usage are, should be investigated further.

Individual Case Treatment

The key question in modern case to mode assignment is how to achieve general survey plan execution whilst still allowing for spontaneous individual or group case treatments?

One answer to this is to allow a certain degree of freedom within each mode’s data collection. The general survey plan controls which cases are to be processed in which mode. It controls when the data collection in a certain mode may start and end per case. But what exactly happens during that phase, is planned by the component “within-mode case management”. So when thinking about a mode, there are two parts to it. The mode’s questionnaire component and the mode’s case management component. Countries using the BLAISE software already have such within mode case management components for CAPI and CATI. Countries not using BLAISE have in-house developed within-modes case management components. Either way, in all of the components very similar functions are built in:

- In within-CAPI case management components, interviewers can administer the cases that are assigned to them by the general survey plan. The interviewer can freely choose when and how to contact his or her case. Most importantly, the within-CAPI case management component enables the interviewer to set the disposition and contact codes. Some countries provide a set of follow up actions for the case the interviewer can

choose from. For example, to send a CAWI invitation letter to the case. Also, the within-CAPI case management components seem to differ only in the additional functions that are offered to the interviewer in order to assist him or her during this process. In the interviewed countries, functions like customized performance reports, maps for case localization, route planning, interview appointment calendars, additional survey info, messaging with NSI and GPS tracking were mentioned.

- In countries where an interviewer can either act as CAPI or a CATI interviewer, the within-CAPI case management component acts also as within-CATI case management component, with only small additional functions like auto dialing.
- In countries where there is a CATI studio, the within-CATI case management component resembles tools for telephone studio. The main features in regards to a flexible case management is the possibility for the supervisor to control and change interview appointment slots, the rules of calling queues, redialing rules, and the assignment of cases to special groups of CATI interviewers.
- In the interviewed countries, no information about any tools that could be seen as the within-CAWI or within-PAPI case management component was gained.

Within this project, it was not possible to investigate deeper into the functions of these within-mode case management components. Nevertheless, it became clear that these components offer important functions to gain flexibility in case management. Looking deeper into this could therefore be of value for future work.

Further measures to make individual case treatment possible will be described in the final report, when presenting the best practice usage of an automated survey plan.

Communication with the Cases

Inbound Case Communication in “new” Systems

In WP3 deliverable 3, it was shown that there are different organizational forms for handling the inbound communication. In countries with newly developed data collection systems there seems to be a trend towards centralizing inbound communication. Five of the interviewed countries already have installed a central unit for handling inbound contacts or plan to do so soon. Let's call these units “contact centers”.

In some countries, these contact centers have acquired or developed their own tool for recording and managing the inbound contacts. This was done independently from the development of the data collection system. The tool therefore cannot (yet) communicate with the case administration component of the data collection system. In one of these countries, the survey manager explicitly reported her wish to integrate the tool in their system.

In other countries, the tool for the contact center was acquired or developed by the team responsible for the data collection system. In these countries, the component “inbound contact” can smoothly interact with the case administration of the data collection system. This

is achieved by allowing staff members to access and update the case administration's event diary (see page 15).

One important feature the inbound communication component needs to consider, is that different staff members may be needed to effectively solve a case's request. Depending on the request, you either need the staff from the contact center, data collection unit, subject matter unit, IT-department or CATI-studio. In countries where the data collection is outsourced (but the external company still uses the data collection system of the NSI), this even means to give external persons access to the case administration's event diary.

Another feature of the inbound communication component is to unify all possible channels of contacts. Case contacts may traditionally happen via letter, email or telephone. But some countries are already thinking about offering new channels of contacts, such as webforms, online chats, sms, whatsapp and so on. Regardless of channel, the contacts should be processed in the same standardized way.

A third feature of the inbound communication component is to provide the possibility to initiate the most often needed fieldwork actions with the click of a button. For example, to send the CAWI login letter once more or to set a new interview appointment.

One interviewed country seems to already have implemented all three features into their inbound communication component. This best case will be presented in detail in the final report.

Outbound case communication in “new” systems

Very similar to the trend in inbound communication, countries with newly developed data collection systems seem to strive towards an organizational and technical centralization of the outbound communication. In these central communication units, all outgoing written communication (such as letters or emails) is being planned, designed and conducted.

For the design step, they make use of special tools, either in-house developed or external tools like R-LaTeX or Canon's Inspire Designer. The key function of these tools is to design text document as templates. Per template, it must at least be possible to refer to data stored in the case administration component of the data collection system. For example, in the template you may refer to the case's postal address. More advanced design tools enable the template designer to refer to all kinds of data of the data collection system, like answers given in the questionnaire. Most advanced design tools allow for variable texts within the template, based on freely definable conditions. For example, based on the masterdata “Birthdate of Household Member” it is calculated how many adults live in the household. And based on that condition, the text later will resolve either to “please make sure that you complete the questionnaire by Sunday 10.02.2019” or “... that all household members aged 18 or older complete their questionnaires by Sunday...”. The latter function becomes of special importance in adaptive

designs, where content of written documents is tried to be tailored to certain groups of cases. In this context, it may also be needed to integrate variable graphical elements within the documents.

Depending on the architecture of the data collection system, these templates then are administered within the design component or in an own template administration component. In any ways, the data collection tool can make use of the template when needed, and automatically generate and send the final document for the specific cases. This process is either automatically triggered by the general survey plan (see page 17) or, in countries not having the general survey plan tool, this is manually triggered by the survey manager within the template administration tool. For example, in one country this is being done by importing a case list (that resulted from a search case query, see page 17), choosing the right template for this list, and then press the button “Send”.

The sending should be possible for the most common channels: letters, emails and SMS. Some countries are already thinking about new channels like whatsapp. It is important to note, that the information if the document has been successfully sent, should be transferred back into the case administration of the data collection system. For sending letters, one of the issues seems to be how a technical connection with the NSI’s internal postal service could be built. For emails, an open issue seems to be how bounce-back emails (emails that cannot be delivered because of wrong email-address or technical issues such as full mailbox) are to be handled by the system.

Conclusion

Traditional data collection systems are challenged by mixed-mode surveys in mainly three areas of data collection:

(1) Questionnaire Production: mixed-mode surveys call for intensive questionnaire design, programming and testing to assure it functions the best possible way in all modes. For that reason, some countries have started to integrate a questionnaire production component within their data collection system. This component brings together the steps design, programming and testing by offering user-friendly point-and-click questionnaire production. One important issue here seems to be the questionnaire metadata standard. Two of the interviewed countries already started to use DDI. The use of a metadata standards is promising as this would ease the interchange of tools related to the questionnaire, such as question banks, questionnaire and dataset documentation and even the electronic questionnaire itself. Further research is needed to determine the most appropriate metadata standard for NSIs, with special attention to compability to academia and public opinion surveys.

(2) Case Management: mixed-mode surveys challenge the case to mode assignments of traditional data collection systems, as modern survey designs get very complex, using a mix of mixed-mode design types. For that reason, all of the interviewed countries developing new systems centralize the case administration within their systems. Doing so, all these countries have the need to manage masterdata, statusdata and event history data per case. It became clear that within the ESS, a standardization of disposition codes and temporary contact codes could be a promising task. Not only would this strengthen the comparability of response rates, it would also save resources in the NSIs having to come up with standards across their surveys and modes themselves. Furthermore, if this crucial element of case management would be standardized, the interchange of components communicating with the case administration would be eased. Finally, it was striking that many of the countries with new systems strive towards the use of a pre-defined survey plan that is executed automatically. If choosing this very efficient approach, careful measures must be taken to still allow for spontaneous individual or group case treatment. How the contrast between standard survey plan and individual detour is resolved in practice should be further investigated.

(3) Communication with cases: there is a trend in countries with new data collection systems in centralizing both inbound and outbound communication. Central inbound communication seems to best be organized as contact centers. But not many countries have integrated the tools used within the contact centers into their data collection systems. Those that have, make use of the cases's event diary. As one country shows, unifying all inbound contact channels, even more modern ones like webforms seems promising. For outbound communication three components are being used, namely template design, template administration and sending written communication via different channels. Here the usage of external tools and their integration into the data collection system seems to be more common than in other areas' components.

Literature

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Annex

Annex 1: Typology of Data Collection Systems

Degree of Component Integration	
I1	Components of domain Survey Instrument, Interviewer Management, Case Management, Monitoring/ Reporting are integrated in one system
I2	Transition from old systems of type I5 to new system of type I1
I3	Components of domain Interviewer Management, Case Management and Monitoring/ Reporting are integrated in one system. Components for Survey Instrument partially integrated.
I4	Multiple systems in use. Each system has its own components of domain Survey Instrument, Interviewer Management, Case Management, Monitoring/ Reporting integrated.
I5	Most components of the domains Survey Instrument, Interviewer Management, Case Management, Monitoring/ Reporting are stand alone tools, not well integrated with one another.
Degree of Survey integration	
S1	One single data collection system for all social surveys.
S2	Systems in transition towards S1.
S3	Multiple systems running parallel: an own system for certain modes.
S4	Multiple system running in parallel: some systems for certain modes and some for certain surveys.
S5	Multiple systems running parallel: some systems for internal and some for outsourced surveys.
S6	Multiple systems running parallel: an own system for each survey.
Completeness of Components	
C1	System offers components for all of the domains Survey Instrument, Interviewer Management, Case Management and Monitoring/ Reporting.
C2	System misses components for one or two of the domains Survey Instrument, Interviewer Management, Case Management and Monitoring/ Reporting.
C3	System misses components for three or four of the domains Survey Instrument, Interviewer Management, Case Management and Monitoring/ Reporting.
Usage of commercial/external software tools	
T1	All components are fully developed in-house.
T2	Most components are developed in-house, some external tools are in use.
T3	BLAISE questionnaire supplemented by in house developed components.
T4	BLAISE questionnaire supplemented by in house programmed external products.

For a full description of the typology, see WP3 - Deliverable 1: Desktop review exercise and draft typology, pg. 12ff.