

Statistical Surveys in Households and by Individuals in Slovakia – the use of Blaise 4 / Blaise 5

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1. Abstract

Blaise has been a data collection and processing platform for social statistics, demographics and consumer surveys in Slovakia. In the year 2016 this includes such as The Labour Force Survey (LFS), The Survey on Information and Communication Technologies in Households and by Individuals (ICT), The Household Budget Survey (HBS), The Consumer Survey (CS), Statistics on Income and Living Conditions of Households (EU SILC) and more. With respect to questionnaire content, both - wording and methodology comply with European regulations. Data obtained in surveys are sent to Eurostat, while they are also used in national statistics.

The interview process realized by PAPI / CAPI methods by tablets (without possibility of on-line web access) - requires a special management and survey progress monitoring and places heavy demands on the software. The program has to be user friendly and conform for using Windows tablets and CAPI method for face-to-face interview. Among the many objectives, the main, and most significant, is the quality of the data. That is why many multiple checks are already incorporated at an early stage of data collection. The data have to be verified and subjected to various controls and comprehensive protocols (Manipula programs). Checks of some surveys are extended to include data obtained in the previous period for comparison with the new values.

This paper discusses the topics mentioned above. The concluding part provides some practical exhibitions of the Blaise 4 solution and the Blaise 5 development version of our the most difficult survey SILC, including selected identical illustrations (comparisons).

2. Introduction

Statistical Office of the Slovak Republic has used Blaise survey solutions since about 1992. The personal Blaise experiences of the authors of this paper have started at the end of 2013 together with organizational changes.

Initially household surveys were carried out in the Slovak conditions at 2 levels: centralized and decentralized. Centralized level represented central Statistical Office of the Slovak Republic, decentralized level comprised of 8 regional offices. Nowadays Statistical Office of the Slovak Republic is still the main coordinator and data processor of data for EU surveys. At decentralized level some changes happened in terms of responsibilities, so one of the regional offices is now coordinator of data collection, data recording and creation of regional databases within surveys. Within statistical organization structure it became part of the central Statistical Office now as *Section of Industrial Data Collection and Processing and Field Surveys in Banská Bystrica* (hereinafter referred to as “Section of Field Surveys”) which plays substantial role for realization of household surveys.

The authors of this paper are members of the department team for data collection supervision which includes activities such as a software development, training of interviewers, control activities and sending output data ASCII files to the central office.

3. Overview of Blaise Survey Implementations

Blaise data collection and processing program for each survey has to be created in two versions – for interviewer and administrator.

3.1 Interviewer Program Package

The basic program version for interviewer allows working exclusively with a household sample individually assigned to him/her. The structure of the survey sample, its range and the update possibility depends on the kind of survey. Using a simple start-up Visual Basic Script (VB script) the interviewer can record a new questionnaire during face-to-face interview or data from the paper form in recording phase as well as update them. Each interviewer has his/her own unique code which is required in each questionnaire record and update and is stored into the database together with a current date and time systemically (used USERNAME, SYSDATE, SYSTIME). These elements are very significant for our management control process.

Blaise questionnaire is complemented by several control and balance protocols as well as export function (via Manipula). Data export has to be executed on a monthly basis (or how often required) – at the interviewer local device. Subsequently, it must be transferred to the central section network server for data processing.

Table 1. Overview of Selected Blaise 4 Survey Solutions

Survey / Questionnaire	Number of Paper Questionnaire Sections	Maximum number of Interviewed Persons	Number of Blaise 4.8 Solution Screens	Number of surveyed Fields			Number of AUXFIELDS	
				Total	per Household	per Person (12 Persons)		
Monitoring of EHIS	-	-	1	14	14	-	4	
Monitoring of HBS	-	-	1	19	19	-	3	
Consumer Survey (CS)	1	-	4	45	45	-	6	
Household Budget Survey (HBS) - the small variant	1	12	11	675	39	53	416	
Household Budget Survey (HBS) - the full variant	3	12	Parts A, B	45	1 408	772	53	10
			C - Daybook	57	6 270	6 270	-	6
Survey on Information and Communication Technologies in Households and by Individuals (ICT)	1	-	28	80	80	-	8	
Statistics on Income and Living Conditions of Households + Grant Project (SILC GP)	3	12	175	5 413	133	440	136	
Statistics on Income and Living Conditions of Households (SILC)	3	12	173	5 280	132	429	136	

Table 2. Number of Used Classifications and Manipula Files

Survey / Questionnaire	Number of	
	used Classifications	Data Checking and Monitoring Manipula Files
Monitoring of EHIS	2	5
Monitoring of HBS	1	9
Consumer Survey (CS)	4	11
Household Budget Survey (HBS) - the small variant	4	9
Household Budget Survey (HBS) - the full variant	5	8
	8	10
Survey on Information and Communication Technologies in Households and by Individuals (ICT)	3	9
Statistics on Income and Living Conditions of Households + Grant Project (SILC GP)	9	6
Statistics on Income and Living Conditions of Households (SILC)	9	6

3.2 Administrator Program Package

Blaise interviewers data export files already saved at the central section network server have to be put together into one complete file containing data from all regions within the Slovak Republic. Data errors, abnormalities and remarks of particular files have to be preserved for subsequent checks at the central section level.

The administrator program package contains the administrator start-up VB script of all basic functions extended to control arrangements, summarization and evaluation protocols (rich using of Manipula). Afterwards, administrator can create final Blaise and ASCII export data files.

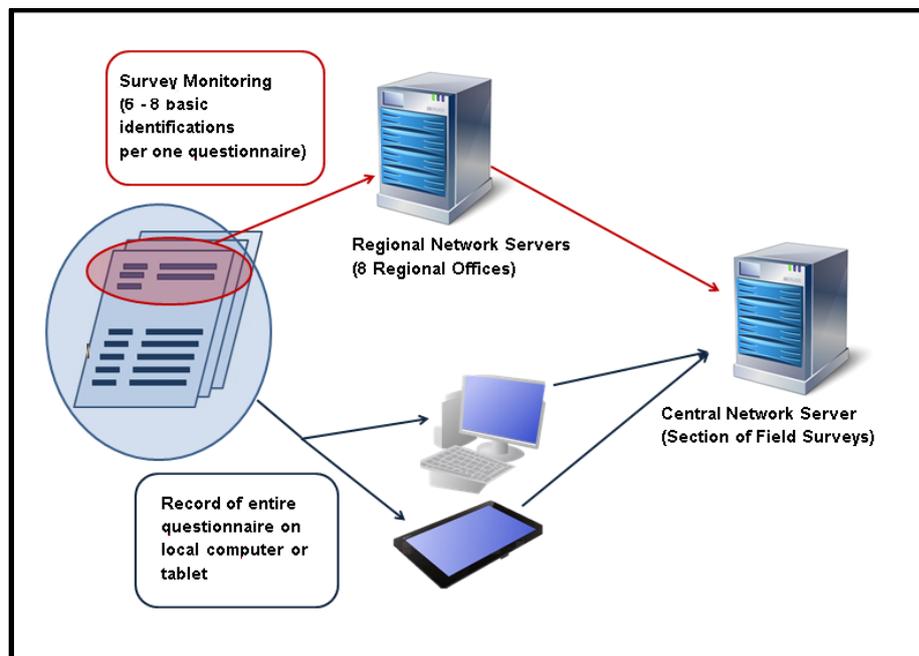
4. Data Collection Progress Monitoring

Most of household surveys use an address based sampling. Because of using only PAPI and CAPI data collection methods following questions are raised:

- How is data collection going on?
- Where, why and whether has the process been interrupted or delayed?
- How successful is interviewers work?
- What is a development of sample compliance in terms of multiple criteria?

During the off-line data collection period we are interested in the real structure of the sample and the interviewer's way towards data, too. Interviewers report about their work by inputting several basic data into the local regional monitoring system, thereafter they make data export to the central section network server (Figure 1).

Figure 1. Survey Progress Monitoring Scheme



4.1 Program and Reports

Figure 2 illustrates a screen of the monitoring program with inputted basic information about visiting of the specific household. We can see how many visits (1) were realized by interviewer (of code 133), which interview method was used (PAPI for part A of the questionnaire, CAPI for part B), how many members the household has (3) and more.

Figure 2. Blaise 4 HBS Monitoring Program - Input of Interview Basic Data

EVIDENCIA - MONITORING - Rodinné účty 2016 Opýtavateľ: 133 - Alex Clever Kód domácnosti: 11001201

Spôsob získania dotazníka RÚ/B

Záznam dotazníka RÚ/B na papierový dotazník alebo na tablet

Konečný výsledok zisťovania:

1. Papierový dotazník
 2. Záznam na tablet

ID_DOM: 11001201 Pocat_nav: 1 Pocat: 3
 IKODOP: 133 Vysledok: 11 DSp: Pohlavie: 2 Žena
 KRAJ: 1 Dat_nav: 5.12.2014
 OKRES: 108 PAPIA: 1 A_PAPI: Dat_nar: Vek: 62
 NazObec: Blatné PAPIB: 8 B_CAPI: Poznamka: číslo domu nie je viditeľné

By using the monitoring program we can control multiplicity of households, age structure of respondents and even more before they will be reached in the real survey data file.

As can be seen in Figure 3, there is something wrong in records of the interviewer of code 135:

- A respondent of the first household (of ID 11000101) is younger than allowed (<18).
- Recording of the second questionnaire (of ID 11000201) was probably interrupted due to EMPTY variables (NE).
- Logical totals do not match.

Only the third record of ID 11000301 is completed and OK (a respondent is a man of three-person household and between 55 and 64 year of age). Seven days later the interviewer of code 135 has inputted seventeen new questionnaire records. A data error is still remaining in his/her control protocol (a little star in Figure 4). We expect a comment or explanation of why a control was left without correction or confirmation.

Figure 3. Blaise 4 HBS Monitoring Program - Output Report Snippet No. 1

```

Bilancia výberu vyšetrených domácností podľa opyt.-podrobne: 3.3.2016 15:20[B]
      (za celý dostupný súbor evidencie RÚ 2016)
-----
M: muži  Ž: ženy          v1: 18-24 r.  v5: 55-64 r.
NE: prázdny údaj        v2: 25-34 r.  v6: 65-74 r.
<18: zadaný nízky vek  v3: 35-44 r.  v7: 75 a viac r.
x?: zadaný vek bez zadania pohlavia
v4: 45-54 r.
-----
kr  kop  č.d.      Členná domácnosť  |  M  Z  |  veková skupina
-----
      1  2  3  4  5+  |  ---  ---  |  v1  v2  v3  v4  v5  v6  v7
-----
L 133 11001201  |  ---  ---  x  ---  ---  |  ---  ---  x  ---  ---  ---  ---
Spolu opyt. 133: |  6  8  2  4  3  |  M : 8  |  1  3  0  2  0  1  1
      spolu dom.: |  23  |  Ž : 15  |  2  4  3  3  1  2  0
-----
L 135 11000101  |  ---  ---  ---  ---  x  |  x  ---  |  <18  ---  ---  ---  ---  ---
L 135 11000201  |  NE  ---  ---  ---  ---  |  ---  ---  |  NE  ---  ---  ---  ---  ---
L 135 11000301  |  ---  ---  x  ---  ---  |  x  ---  |  ---  ---  ---  x  ---  ---
Spolu opyt. 135: |  0  0  1  0  1  |  M : 2  |  0  0  0  0  1  0  0
      spolu dom.: |  3  |  Ž : 0  |  0  0  0  0  0  0  0
    
```

As shown in Figure 4, there are 6 situations to express an outcome of the visit. The result of the visit can be:

- A cooperating household (11) – only this code is desired
- Refusal to cooperate (21)
- Nobody at home (22)
- Nobody able to answer (23)
- Uninhabited apartment or house (24)
- Another reason (25).

In general, there can be made three attempts to visit a household. The report snippet shows how successful interviewers are from both personal and regional view (the example of region 1). This kind of report is especially important for us to issue guidelines for further action.

Figure 4. Blaise 4 HBS Monitoring Program - Output Report Snippet No. 2

Počet dotazníkov v evidencii RÚ podľa opytovateľov: 10.3.2016 11:15 [Ad]										
(za celý dostupný súbor evidencie RÚ 2016)										
Dsp (11): Spolupracujúca domácnosť					DNezp (23): Domácnosť nespôsobilá odpovedať					
Dodm (21): Odmietnutie spolupráce					DNeob (24): Byt je neobývaný					
DNez (22): Domácnosť nezastihnutá					Inyd (25): Iný dôvod					
P o č e t podľa výsledku návštevy										
Kraj	Kop	Spolu	vyšetrených Dsp (11)	Nevyšetrených (21 - 25)	Dodm (21)	DNez (22)	DNezp (23)	DNeob (24)	Inyd (25)	Meno opytovateľa
1	131	50	23	27	7	20	0	0	0	Peter XXX
1	132	40	23	17	3	14	0	0	0	Anna YYY
1	133	50	23	27	27	0	0	0	0	Alex Clever
1	134	50	24	26	12	11	2	0	1	Dana KKK
1	135	40	20	20	12	8	0	0	0*	Jana LLL
1	136	40	23	17	9	8	0	0	0	Maria MMM
za [1]:		270	136	134						
2	226	13	8	5	4	0	0	1	0	Martin NNN

4.2 Monitoring Log File

Some of Blaise 4 solutions include a supervision of an interviewer work. Such program monitors activities of the interviewer in the background while running the application or associated data control activities. A log file is created (keyword DAYFILE) and results are only available to a project manager (Figure 5).

Figure 5. Blaise 4 Monitoring Log File

```

20160506,13:14:44 *****
20160506,13:14:44 MANIPULA 4.8.4.1880, @ Statistics Netherlands 1989-2014
20160506,13:14:44 Setup: SB16n_exp.man
20160506,13:14:44 Export záznamov SB16 - 1/2 - BLAISE to BLAISE
20160506,13:14:44 Parameter:
--- *n 122 6.5.2016 13:14 5 gordis
20160506,13:14:45 File: INPUTFILE1 (d:\SB16n\SB16n)
20160506,13:14:45 Records read: 9
20160506,13:14:45 File: OUTPUTFILE1 (d:\SB16n\SBExp\SB16n)
20160506,13:14:45 Records written: 9
20160524,11:38:44 *****
20160524,11:38:44 MANIPULA 4.8.4.1880, @ Statistics Netherlands 1989-2014
20160524,11:38:44 Setup: SB16n_del.man
20160524,11:38:44 Prechod na nové obdobie
20160524,11:38:44 Parameter: ANO
20160524,11:38:50 --- *n 122 24.5.2016 11:38 9 gordis
20160524,11:38:50 --- Nasleduje v ý m a z dát za minulé obdobie!
20160524,11:38:50 File: SB (d:\SB16n\SB16n)
20160524,11:38:50 Records read: 9
20160524,11:38:50 Records written: 0
20160524,11:38:50 Records deleted: 9
20160524,11:38:50 File: SBDEL (d:\SB16n\PROTOKOLY\SBdel.rtf)
20160524,11:38:50 Records written: 11

```

Following findings can be identified in the log file:

- whether check protocols were executed by the interviewer or not
- whether he/she actually used CAPI method as declared
- where (physically) the application is located
- and more (in Figure 5 we can also see that the interviewer of code 122 has not worked with the software for eighteen days).

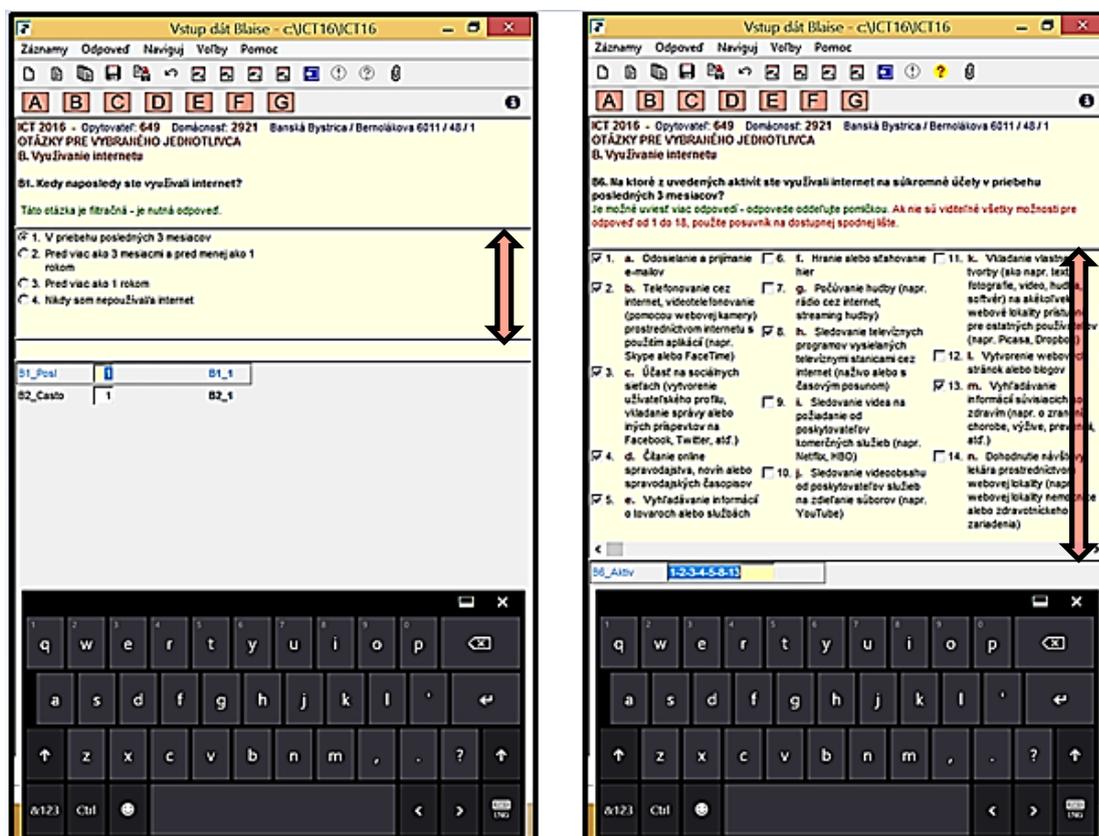
5. Blaise Program Layout Requirements

Our Blaise 4 programs are designed for use on computers and tablets. The interview process places heavy demands on the software which has to be user friendly. We recommend setting of the tablet font to a larger one (the best setting is 150 %) and to switch to portrait mode (“to the height”). Tablet touch screen keyboard may be positioned at the bottom of the screen at a free place if necessary. There is also allowed to use a simple Blaise keypad toolbar to enter numerical data.

Requirements for the Blaise 4 questionnaire layout:

- A floating height / width of an info panel so that a whole extensive question text is visible
- A floating height / width of an info panel so that all or as many as possible response options are visible (Figure 6) and there is no need to use a vertical or horizontal scroll bar, at all
- Fields location in a such way that corresponds with the questionnaire paper form proposals (an order of fields, a grouping of several fields related to a slot on a screen)
- To enable fast moving to another place of a program structure according special requirements (skipping at selected questions or modules; see “A, B, C, ... , G” in Figure 6)
- To enable fast moving into a block of questionnaire questions of other person (depending on the number of household members)
- To enable the answer input by typing an option number using a keyboard and more.

Figure 6. Blaise 4 - Two Questions in Two Different Layouts on Screens with Used Tablet Touch Screen Keyboard



6. Quality of the Data as the Most Important Output Requirement

Depending on a survey complexity our solutions contains numerous error checks that are performed directly at the questionnaire recording. Blaise has a very well invented principle of a field definition in a data model. Already by field definition – errors in recording are eliminated. However, the program needs to ensure compliance of certain relations and links among items. It is important to define conditions for evaluating error checks correctly. We must respect practical experiences which require incorporation of many data checks (Table 3). This ensures a significant increase of final data quality.

The input values are necessarily validated already during the interviewing. If the data value is extremely different from the average one, it can usually be caused by errors in the recording. Another time, an anomaly can occur that need to be assessed and after the verification corresponding check may be suppressed. Many built-in checks are intended to assess interdependencies among questionnaire items. Furthermore, special year-over-year (longitudinal) checks have been incorporated into our Blaise solution.

Table 3. Blaise 4 Solutions – Number of Included Checks

Survey / Questionnaire	Number of Checks							
	Total	of which		of which		of which		
		per Household	per Person (12 Persons)	HARD	SIGNAL	stored by EDITTYPE	not stored by EDITTYPE	
Monitoring of EHIS	8	8	-	2	6	8	-	
Monitoring of HBS	8	8	-	2	6	8	-	
Consumer Survey (CS)	14	14	-	1	13	14	-	
Household Budget Survey (HBS) - the small variant	1 221	33	99	19	1 202	753	468	
Household Budget Survey (HBS) - the full variant	Parts A, B	880	112	64	19	861	597	283
	C - Daybook	10	10	-	5	5	3	7
Survey on Information and Communication Technologies in Households and by Individuals (ICT)	59	59	-	26	33	59	-	
Statistics on Income and Living Conditions of Households + Grant Project (SILC GP)	3 946	130	318	216	3 730	3 058	888	
Statistics on Income and Living Conditions of Households (SILC)	3 906	138	314	216	3 690	3 054	852	

6.1 Classical Kind of Checks

Blaise questionnaire includes designed checks in such range and amount not to slow down (to go smoothly) data entry and data correction, especially if the interview is done by face-to-face. Checks are conditions that have to be satisfied. The check instruction defines a hard error ((keyword CHECK) and the signal instruction is for a soft error definition (keyword SIGNAL). If the values of the fields involved do not satisfy the statement, an error is invoked. Hard errors must be fixed and a clean record does not contain them. Soft errors have to be evaluated and subsequently suppressed or changed. We prefer to use signal checks in our solutions if possible.

Examples of data checks:

- An age of parents should be at least 16 years.
- If a person has a grandson, this grandson should be at least 32 years younger (to prevent contrary coding of relations between two members of the same household).
- If there is not a child in the household, why any household's member receives family allowances?
- If a person is employed, he/she should have an employment income.
- And more.

Special classical checks are those which are done for all ordered pairs of household members (“B” in the Table 4).

We often use enumerated fields of type EDITTYPE to gain access to the results of the checks what are particularly interesting in the final stage of output data validation.

Figure 7. Blaise 5 SILC after Conversion – How to Evaluate and Preserve the Edit Result

```

161 B2911;
162 IF B2911=Ano THEN
163     SIGNAL Er_B21 | (pocV15+pocV17)>=1
164     "<M>KB21: </M><Z>V domácnosti nie je nezaopatrené dieťa vo veku 15 - 19 rokov a poberá štipendium</Z>" ;
165     B2912;
166     B2913;
167     IF (B2912<>DK AND B2912<>RF) THEN
168     SIGNAL Er_B29 | ((B2912>=22.61) AND (B2912<=B2913 *452.1))
169     "<M>KB29: </M><Z> Overté výšku štipendií v domácnosti - výška štipendií v roku 2015 bola v intervale 22,61 až 45,21 EUR </Z>"
170     ENDIF
171 SIGNAL Er_B22 | (pocV15+pocV17)>=B2913 INVOLVING (B2913, A_A.PocOD)
172 "<M>KB22: </M><Z>V domácnosti je menej nezaopatrených detí vo veku 15 - 19 rokov, ako na ktoré domácnosť poberá štipendium</Z>" ;
173 ENDIF;

```

6.2 Year-Over-Year Kind of Checks

Year-over-year (YOY) comparisons are an effective way to evaluate data. This method facilitates the cross comparison of sets of data. YOY checks can be seen in our SILC survey solution. The basic principle of the SILC survey is a sample repetition with file variations rules. The specific case of check occurs when the household or the respondent are in the survey sample repeatedly. Then current answers are compared to previous year values and if they are not consistent they must be verified. For this purpose several previous data files have to be imported to the solution then have to be adapted for key searching (Table 4).

Compared to previous year data, we have defined many new checks in the current solution. As a result some kinds of errors do not occur in the output file now, at all.

We can see the definition of several classical and YOY checks in the Table 4

As Figure 8 denotes, the signal check of KBM28 has to be verified if the current specified payment for electricity differs by more than 20 % compared to previous year value.

Figure 8. Blaise SILC Solution - Program Snippet of YOY Checks

```

{Kontroly B_B - medziročné}
IF (B_B.B21[2].B21b<>EMPTY AND (PData_BF.SEARCH(A_A.ID_DOM))) THEN PData_BF.READ;
IF (PData_BF.B21b2<> EMPTY AND B_B.B21[2].B21b<>DK AND B_B.B21[2].B21b<>RF) THEN
    SIGNAL Er_BM27 | ((PData_BF.B21b2*1.2>=B_B.B21[2].B21b) AND (PData_BF.B21b2*0.8<=B_B.B21[2].B21b))
    "@MKBM27: @M@Z Náklady na bývanie - úhrada za teplo a teplú vodu sa líši o viac ako 20% oproti
    minulému roku ( ^PData_BF.B21b2) - overte situáciu. @Z" ;
    ENDIF;
ENDIF;

IF (B_B.B21[3].B21b<>EMPTY AND (PData_BF.SEARCH(A_A.ID_DOM))) THEN PData_BF.READ;
IF (PData_BF.B21b3<> EMPTY AND B_B.B21[3].B21b<>DK AND B_B.B21[3].B21b<>RF) THEN
    SIGNAL Er_BM28 | ((PData_BF.B21b3*1.2>=B_B.B21[3].B21b) AND (PData_BF.B21b3*0.8<=B_B.B21[3].B21b))
    "@MKBM28: @M@Z Náklady na bývanie - Elektriina sa líši o viac ako 20% oproti minulému
    roku ( ^PData_BF.B21b3) - overte situáciu. @Z" ;
    ENDIF;
ENDIF;

```

Table 4. Blaise 4 and 5 SILC Solutions – Example of Error Checks Definition List

Name	Kind of check ¹	Type	Meaning of check	Description of check
G01	C	Hard	Nedovolený vek respondenta! Vek musí byť vyšší ako 11 rokov.	$G1_Vek \geq 12$ OR $G1_Vek = DK$ OR $G1_Vek = RF$
G02	C	Signal	Pre osobu vo veku do 16 rokov môže byť v otázke na rodinný stav uvedené len slobodný/á	IF NOT ($G1_Vek = DK$ OR $G1_Vek = RF$) AND $G1_Vek <= 15$ THEN $G1_RodSt = Slob$
KAN48	B	Signal	Vek dieťaťa má byť aspoň o 16 rokov menší ako vek rodiča	IF $OsTAB[02].Vzt01=OtMa$ THEN ($OsTAB[02].Vek-OsTAB[01].Vek$) ≥ 16
KAN50	B	Signal	Vek vnúčaťa má byť aspoň o 32 rokov menší ako vek starého rodiča	IF ($OsTAB[02].Vzt01=Vnuca$ AND $OsTAB[01].Vek <> EMPTY$)
KAN56	B	Signal	Osoba ^ $OsTAB[i].Ido$ v domácnosti má viac manželov/manžieliek a druhov/družiek ako 1	($A_B.OsTAB[i].manz1+A_B.OsTAB[i].druh1+ \dots +A_B.OsTAB[i].manzj+A_B.OsTAB[i].druhj$) ≤ 1
KBM01a	Y	Signal	Náklady na bývanie celkom	(($B_B.B21m+PData_BF.B22$) $\ast 1.2 >= B_B.B21t$) AND (($B_B.B21m+Data_BF.B22$) $\ast 0.8 <= B_B.B21t$)
KBM28	Y	Signal	Náklady na bývanie - Elektrina	$B21[3]b21b$ (Year) = $b21b3$ (Year-1) +- 20%
KBM29	Y	Signal	Náklady na bývanie - Plyn	$B21[4]b21b$ (Year) = $b21b4$ (Year-1) +- 20%
KCM07	Y	Signal	Starobné dávky	if $C8011$ (Year-1) = $C8011$ (Year) = 1 then KONTROLA: väčšia z ($C8012$, $C8014$ - minulý rok) +- 20% z (menšia $C8012$, $C8014$ - tento rok)
	Y	Signal		if $C8012$ (Year-1) = $C8012$ (Year) = 1 then KONTROLA: väčšia z ($C8022$, $C8024$ - minulý rok) +- 20% z (menšia $C8022$, $C8024$ - tento rok)
	Y	Signal		if $C8013$ (Year-1) = $C8013$ (Year) = 1 then KONTROLA: väčšia z ($C8032$, $C8034$ - minulý rok) +- 20% z (menšia $C8032$, $C8034$ - tento rok)

¹ Kind of the error check: C – classical, B – between two household members each other, Y – year-over-year

6.3 Tools for evaluation of checks

During the data collection phase the interviewer has to check his/her collected and inputted data from inside a record (Figure 9) or by a view to the data browser (Correctness Status and Error Counter columns, Figure 10). Our solutions also include several kinds of control protocols for interviewer to be able to evaluate errors and other required criteria by only one view to his/her records set.

Figure 9. Blaise 4 ICT Solution - Window of All Errors of the Current Recording Questionnaire

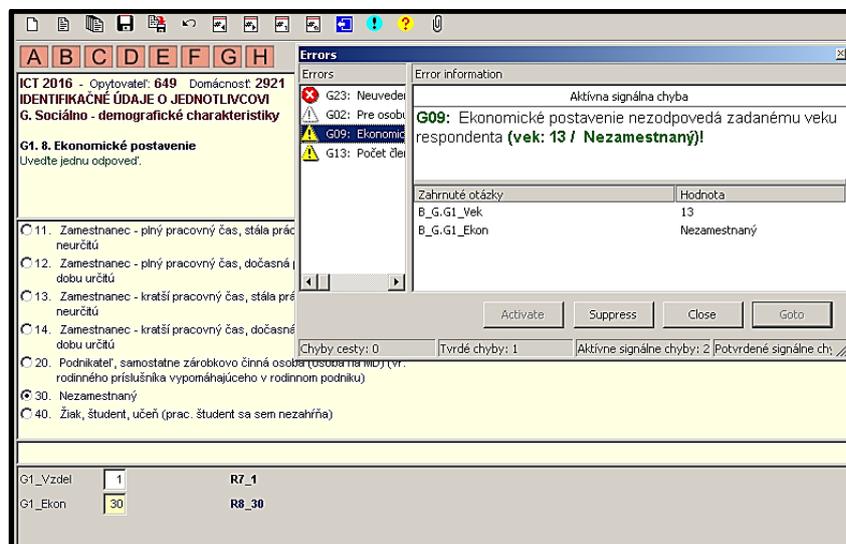


Figure 10. Blaise 4 ICT Solution - Data Browser with the Correctness Status and Error Counter Columns

Status	Error Counter	ID_DOM	KOp	PAPI_S	Kraj	Okres	KodObc	Typ	NazObec	Ulica	SupCD	C
Dirty	2	2921	649	_CAPI	6	601	508438	6	Banská Bystrica	Bernolákova	6011	4
Clean	0	2922	649		6	601	508438	6	Banská Bystrica	Bernolákova	6129	3
Clean	0	2923	649		6	601	508438	6	Banská Bystrica	Bernolákova	6011	4
Suspect	2	2924	649	_CAPI	6	601	508438	6	Banská Bystrica	Bernolákova	6011	4
Dirty	18	2925	649		6	601	508438	6	Banská Bystrica	Bernolákova	6011	4
Clean	0	2926	649		6	601	508438	6	Banská Bystrica	Bernolákova	6129	2

If a survey is simpler and its questionnaire contains fewer questions, the internal design of Blaise solution is easy to navigate. To ensure easy going recording of paper form the EMPTY attribute can be left in a field definition. However, many “non-response” answers are not desired in the final phase. That is why this kind of errors is shown in the error protocol, too.

As can be seen in Figure 11, interviewer of code 649 has to solve indicated problems (G02, G09 ...) in his three inputted questionnaires. Figure 12 as output protocol snippet denotes the recapitulation of records correctness.

Figure 11. Blaise 4 ICT Solution - Control Protocol Snippet No. 1

SIGNÁLNE CHYBY				ZÁVAŽNÉ CHYBY			v ý p i s c h ý b					
Č.D.	KOP	Supp.	Aktív.	Cesty	Hard	Spolu						
2921	649	2	1		1	4	G02	G09	G13	G23		
2924	649	1	2			3	A04	B06	B09			
2925	649		5	12	1	18	G01	G02	G03	G04	G05	G06

Počet záznamov v súbore:
 Spolu: 2 3 1 2 3
 =====
 - počet záznamov s nevykonanou kontrolou: ... 0
 - počet čistých bezchybných záznamov: 17
 - počet všetkých záznamov: 20

Figure 12. Blaise 4 ICT Solution - Control Protocol Snippet No. 2

1: OK - bez chýb
 2: OK - s potvrzenými chybami
 A: aktívne nepotvrdené chyby
 H: hard chyby (závažné chyby)
 P: prázdne (nenatypované) záznamy
 C: chyby cesty

Č.D.	KOP	[1]	[2]	[A]	[H]	[P]	[C]	
2921	649		x	x	x			11/ 0/ 0
2922	649	x				x		21/ 0/ 0 nespoľup.
2923	649	x				x		24/ 0/ 0 neobývaný
2924	649		x	x				11/ 0/ 0
2925	649			x	x		x	11/ 0/ 0
2926	649	x						22/22/11 bez chýb

7. Statistics on Income and Living Conditions of Households (SILC)

Project EU SILC was launched as the pilot survey in 2003 in 6 member states (Belgium, Denmark, Greece, Ireland, Luxemburg and Austria) and in country out of European Union in Norway. Initial year for its implementation was 2004, when survey was carried out in 12 member states, in Norway

and Iceland and in case of new members in Estonia. There was derogation for 10 new member states (including Slovakia), so survey was conducted for the first time in 2005.

SILC is the survey whose aim is to obtain information on income distribution, on level and structure of poverty and on social exclusion. This source of data and information enables not only international comparison of Slovakia within EU, but likewise lays foundations for analyses of living standards of population, conceptual planning and taking measures towards improving quality of life of Slovak population. Basic unit of this survey is private jointly managed household. It consists of the people who permanently occupy together one dwelling and reimburse together the household expenditure. Member of household is also a person who is not relative with other members of household, but he/she permanently shares one dwelling and all household expenditure with them.

The result of statistical processing is a database with well-defined outputs which are then used to calculate the indicators and to analyze the poverty and social exclusion. One of the main outcomes of this survey are common indicators of poverty that are used to measure progress towards the objective of the EU 2020 strategy and which are the basis for evaluation and mutual comparison of the level and structure of poverty in the countries of European Union.

7.1 Structure of Blaise SILC Project

The Blaise 4 SILC solution has been created for two similar projects (SILC GP, SILC) which only differed by the number of questions, the range and structure of the surveys samples (Table 5). Programs are made in accordance with defined checks and requirements for all collected variables, which Eurostat update every year. And in addition there are controls included in accordance with our national specifications (for example fixed amount of some social benefits, checks in terms of respondent's age and etc.).

Table 5. Blaise 4 SILC Solution – Summary Overview

Indicator	SILC GP	SILC
Number of Blaise 4.8 Solution Screens	175	173
Number of Surveyed Fields in Total	5 413	5 280
of which: per Household	133	132
per Person (Number of one interviewed Person)	440	429
Number of AUXFIELDS	136	136
Number of used Classifications	9	9
Number of attached previous period Data Files	3	3
Number of attached previous period Data Files Fields	191	191
Number of Checks in Total	3 946	3 906
of which: per Household	130	138
per Person (Number of one interviewed Person)	318	314
of which: HARD	216	216
SIGNAL	3 730	3 690
of which: captured and stored by using EDITTYPE	3 058	3 054
not using EDITTYPE	888	852
Number of Data checking Manipula Files	6	6

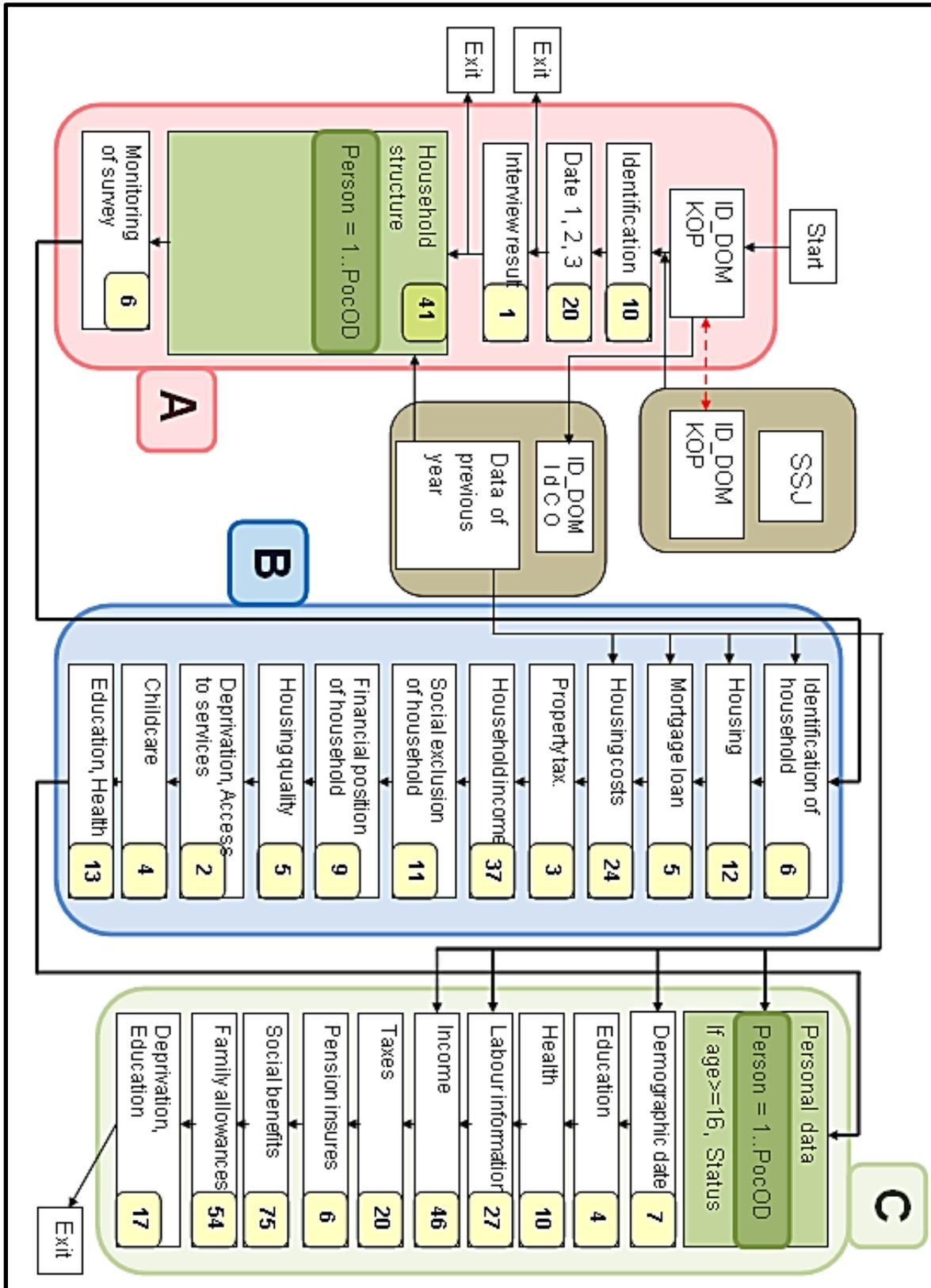
Interviewers acquired the required data based on the information directly from persons in households and filled them in the questionnaires.

As can be seen below (Figure 13), there are 3 types of them:

- SILC 1-01/A – Household structure
- SILC 1-01/B – Household sharing of expenditures data

- SILC 1-01/C – Personal data, which also served as a basis for input processing.

Figure 13. SILC Survey Questionnaire Structure Scheme



7.2 Selected Examples and Illustrations of Blaise SILC Solutions

SILC survey project means very large, difficult and time-consuming survey. Our Blaise 4 solutions (for last 2 years) were successfully used in the practice. They mainly allowed to work by PAPI method with a tablet testing possibility. We made use Blaise 4 software for data recording with fully benefit.

Conversion of the Blaise 4 SILC questionnaire into Blaise 5 equivalent was done on several attempts due to a lot of external data files and classifications. The new solution has been successfully born. It became clear that it is really only the beginning and much work lies ahead of us. Nowadays we continue in this development process. The following figures illustrate our work from the conversion phase to the most recent design with looking back to Blaise 4.

Figure 14. Blaise 5 SILC Layout – Experiment to Generate Critical Fields

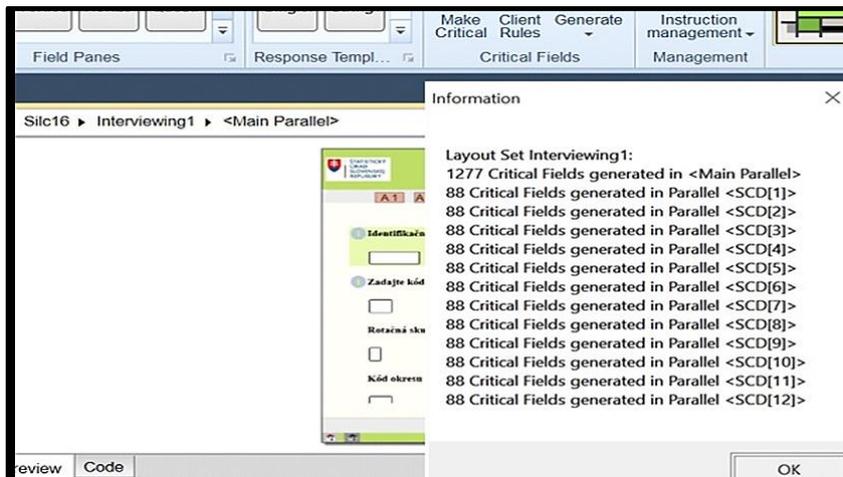


Figure 15. Blaise 5 SILC Resource Editor – Experiment to Insert Image



Figure 16. Blaise 5 SILC – Used Classifications and YOY Data Files (the Source Code)

```

22  USES
23
24  PsilcSSJ  'SSJ\ssj_silc',
25  PCC0086  'silcCis\CC0086',
26  PData_A  'silcCis\DataReg_A',
27  PData_A2 'silcCis\DataReg_A2',
28  PData_A3 'silcCis\DataReg_A3',
29  PData_B  'silcCis\DataReg_B',
30  PData_C  'silcCis\DataReg_C',
31  PISCO08  'silcCis\isco08',          { PC015S  '\SILC14\silcCis\c015S',}
32  PC003S  'silcCis\c003S',
33  PC016S  'silcCis\c016S'

```

As shown in Figures 16 to 18 the solution uses classifications for inputting or searching required data. They are the International Standard Classification of Occupations (ISCO-08), Statistical Classification of Economic Activities (SK NACE Rev. 2), Statistical Nomenclature of Countries and others.

Figure 17. Blaise 4 SILC – Inputting of Citizenship Value (Searching in Classification)

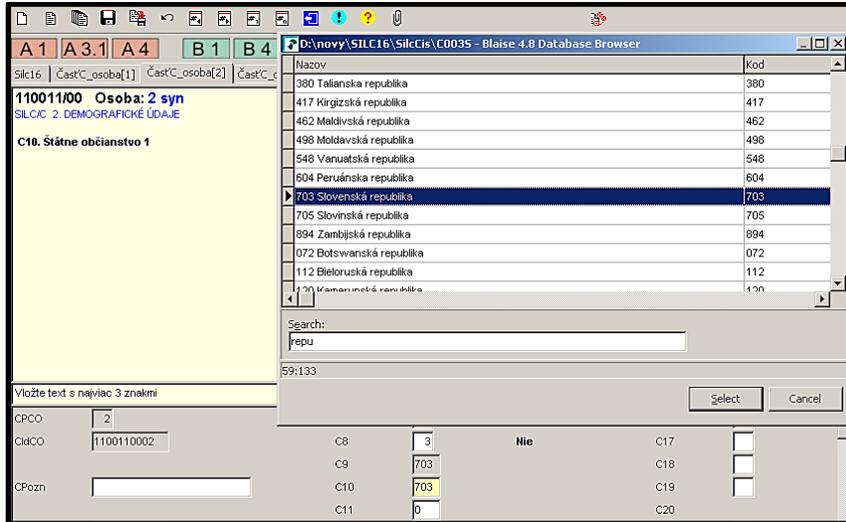
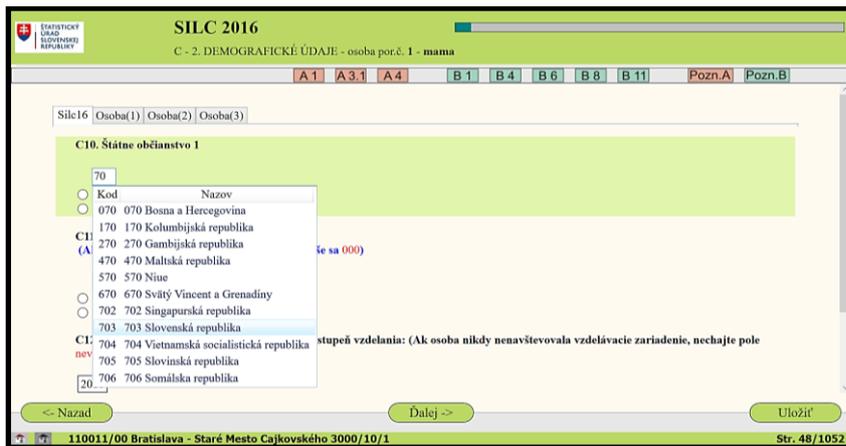


Figure 18. Blaise 5 SILC – Inputting of Citizenship Value (Searching in Classification)



The occurrence of the YOY error can be seen in Figure 19 and 20.

Figure 19. Blaise 4 SILC Solution - Error Window with YOY Check of KBM01a

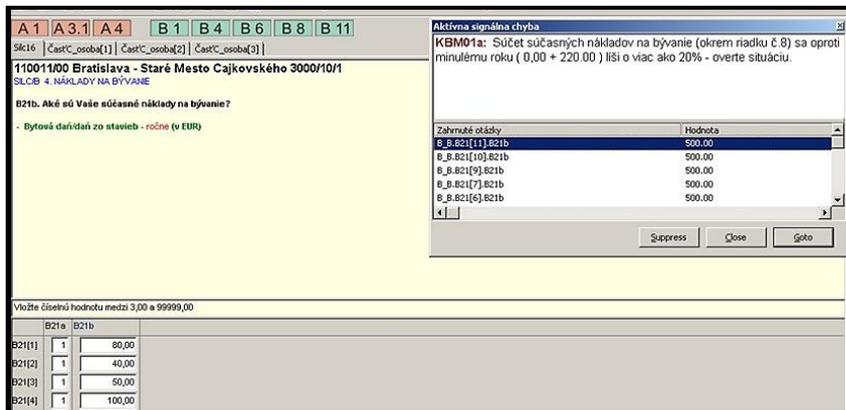


Figure 20. Blaise 5 SILC Solution - Error Message with YOY Check of KBM01a

In Blaise 5 SILC solution we have created a table of household members in another way as in Blaise 4. We have decided to use a rotated table layout due to comments and requests of our interviewers (Figures 21 and 22).

Figure 21. Blaise 4 SILC Questionnaire – Table of Household Members (1 – 12 Persons)

PCO	IJO	IdCO	MNar	RNar	Vek	Pohl	VybOs	SClc	SClb	StatG	Modst	MOU	ROU	M2015	HEA15	MPY	RPY	SIByd	RPVz	ZEA16
OsTAB[1]	1	mama	5	1972	44	2	1	1	1	1								1		1
OsTAB[2]	2	syn	2	1996	20	1	1	1	1	1								1		4
OsTAB[3]	3	príbuzná	7	1970	46	2	2	3	3	3				4	2015			1		1
OsTAB[4]	4	dcera príbuznej	11	2015	1	2	2	4	4	4								1		4

Figure 22. Blaise 5 SILC Questionnaire – Table of Household Members (1 – 12 Persons)

PCO	OsTAB[1]	OsTAB[2]	OsTAB[3]	OsTAB[4]
1	Paradové číslo osoby 1	Paradové číslo osoby 2	Paradové číslo osoby 3	Paradové číslo osoby 4
IdO	mama	syn	príbuzná	dcera príbuznej
IdCO	1100110001	1100110002	1100110003	1100110004
MNar	A11. Mesiac narodenia 5	A11. Mesiac narodenia 2	A11. Mesiac narodenia 7	A11. Mesiac narodenia 11
RNar	1972	1996	1970	2015
Vek	44	20	46	11
Pohl	<input type="radio"/> Muž <input checked="" type="radio"/> Žena	<input checked="" type="radio"/> Muž <input type="radio"/> Žena	<input type="radio"/> Muž <input checked="" type="radio"/> Žena	<input type="radio"/> Muž <input checked="" type="radio"/> Žena
VybOs	<input checked="" type="radio"/> Vybraná osoba <input type="radio"/> Spolužívajúci (nová vybraná osoba vo vzorke)	<input checked="" type="radio"/> Vybraná osoba <input type="radio"/> Spolužívajúci (nová vybraná osoba vo vzorke)	<input checked="" type="radio"/> Vybraná osoba <input type="radio"/> Spolužívajúci (nová vybraná osoba vo vzorke)	<input checked="" type="radio"/> Vybraná osoba <input type="radio"/> Spolužívajúci (nová vybraná osoba vo vzorke)
	Bol v domácnosti v predchádzajúcich vlnách a je jej súčasným členom	Bol v domácnosti v predchádzajúcich vlnách a je jej súčasným členom	Bol v domácnosti v predchádzajúcich vlnách a je jej súčasným členom	Bol v domácnosti v predchádzajúcich vlnách a je jej súčasným členom

Figure 23. Blaise 5 SILC Questionnaire – Screen Design with Parallels

As Figure 23 illustrates (and other of Blaise 5 SILC Figures above), our screen design includes:

- A progress bar
- A current section title (depending on a Role definition of a current field),
- Image buttons for skipping at a specific question or field of a large questionnaire
- Parallels depending on the number of household members
- Field definitions as Help, Interviewer and own specific roles
- Buttons for moving one page backward or forward and for saving a record
- A bottom line of a screen which allows to skip at the first and the last page (by clicking on the little white and dark houses in a left bottom corner)
- A place for current ID household and its address in the middle of the bottom line of each page
- A current page position (from all pages in solution / parallel) in a right bottom corner

8. Summary

Statistical Office of the Slovak Republic has used Blaise 4 household survey solutions for data collection and processing. Nowadays we study Blaise 5 and develop pilot program solutions as a test projects with a vision of their future implementation in practice.

Topics covered in this paper include the overview of the several Blaise 4 statistical projects. We introduce solutions for the data collection progress monitoring as well as Blaise program layout requirements. We describe the way to ensure the quality of the data as the most important need of outputs. The last part deals with the real Blaise 4 SILC program in comparison to the Blaise 5 SILC development version.

The authors describe their personal experiences from data collection and processing as well as from developing and programming activities. The used illustrations and examples selected from the Blaise 4 HBS, ICT and SILC solutions are those of the authors own work.

The authors would like to thank the staff of Section of Field Surveys for their help and comments to the paper.

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