

Blaise 5 CAPI in Collaboration with COTS Software

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1. Abstract

At Statistics Netherlands we are in full swing with the transition process between Blaise 4 and Blaise 5. Our main way to conduct primary data collection is CAWI and of the in total 125 different surveys, xx have already been converted to Blaise 5 CAWI. Also our new CATI channel is on the verge of completion after several pilots and the go-live of the first two surveys in may this year.

So our next task at hand was the CAPI mode, a mode that is quite expensive per interview conducted, but still necessary to get the right coverage for specific target groups in specific surveys.

2. Business case

Our current (legacy) CAPI channel faces a number of challenges:

- The technology used for synchronization between the host system and the local devices is outdated and file driven, therefor quite vulnerable. Loss of data has happened more than once.
- The assignment of addresses to interviewers is done by a ‘as the bird flies’-algorithm, which in a country with as much water as ours leads to up to 30% manual alterations.
- Synchronization is a manually started process and leads to human errors.
- As the other interviewing channels are transiting more and more to Blaise 5, keeping CAPI in Blaise 4 would mean significant extra effort in building questionnaires.
- Field interviewers spend a lot of time (approximately two hours a week, roughly 10% of their working time) on administrative tasks, such as time keeping and travel expense declarations within the company’s ERP system AFAS.

The architectural principles of the Phoenix program (responsible to rebuild the complete data collection landscape at Statistics Netherlands) are as follows:

1. Re-use if technology isn’t outdated
2. Use Commercial-off-the-Shelf software if the vendor isn’t too small
3. Build customized software ourselves only if 1 and 2 are not available

Bearing these principles in mind we investigated how we could form a CAPI channel meeting our specific needs.

As Blaise was already working on the Case Management App (CMA) for CAPI and our approach is to build omni mode questionnaires, Blaise ticks the boxes 1 and 2. But that left us with no solution for the assignment process and the manual labor of administrative tasks. Through our AFAS supplier we came in contact with a AFAS- certified system integrator named Way2Connect, who had already implemented several interfaces between their Link2 software suite and AFAS on the time keeping and expenses side. Furthermore this suite has a build in functionality for route optimization and planning, so it could take care of the address assignment problem.

After a Prove of Concept phase we concluded that the combination of Link2 and CMA would suit our needs the best.

3. Process description: preparation

The future business process starts with a tested Blaise questionnaire, which is deployed to a Blaise server farm. From the host system channel assignments are sent to the Blaise server farm if the addresses are allotted to CAPI. These addresses are not yet linked to a specific interviewer.

From statistical analysis it is known how certain variables have influence on the time it takes to complete the interviewer tasks. These are e.g. age of the respondent and level of urbanization. As these variables are used only within the CAPI channel, the choice was made to enrich the data within the channel by a custom made component: a master table is maintained within the channel linking surveys and variables to average process time and average re-visiting numbers. And each new address will be compared against this master table to enrich the right data. A custom made interface delivers the enriched addresses to Link2, where the assignment of addresses to interviewers takes place.

To be able to make these assignments, Link2 requires knowledge of the work rosters of the interviewers. These rosters can either be made inside Link2 or be transferred from an ERP system by interface. The assignment process within Link2 now optimizes available timeslots of interviewers against respondent addresses (minimization of travel time). The number of iterations is configurable. The result of this assignment process looks as follows (figure 1):

| | Reestijd | Afstand | Forecast b... | Gebruiker | Startdatum | Einddatum | Type activiteit | Normtijd | Ordercode | Volledig Adres | Korte omschr |
|--------------------------|--------------------------|---------|---------------|-----------|------------------|------------------|-----------------|------------------|-----------|--|--------------|
| ▼ | Voor-en achternaam: ABEK | | | | | | | | | | |
| <input type="checkbox"/> | 16,80 | 12,72 | 41,00 | ABEK | 2019-11-05 08:16 | 2019-11-05 08:57 | Interview | 0 uur 17 minuten | 00013974 | Tussendek, 49 - , 1034TR, AMSTERDAM | Interview |
| <input type="checkbox"/> | 4,80 | 1,43 | 37,00 | ABEK | 2019-11-05 09:02 | 2019-11-05 09:38 | Interview | 0 uur 15 minuten | 00013973 | Staghof, 175 - , 1034NZ, AMSTERDAM | Interview |
| <input type="checkbox"/> | 12,00 | 6,95 | 37,00 | ABEK | 2019-11-05 09:50 | 2019-11-05 10:26 | Interview | 0 uur 15 minuten | 00013960 | G.J. Scheurleerweg, 159 - , 1023MZ, AMSTERDAM | Interview |
| <input type="checkbox"/> | 19,20 | 11,72 | 37,00 | ABEK | 2019-11-05 10:45 | 2019-11-05 11:21 | Interview | 0 uur 15 minuten | 00013975 | Landsmeerderdijk, 104 - , 1033PX, AMSTERDAM | Interview |
| <input type="checkbox"/> | 2,40 | 2,14 | 38,00 | ABEK | 2019-11-06 08:02 | 2019-11-06 08:38 | Interview | 0 uur 15 minuten | 00013967 | Kometensingel, 13 - , 1033BA, AMSTERDAM | Interview |
| <input type="checkbox"/> | 7,20 | 5,08 | 41,00 | ABEK | 2019-11-06 08:45 | 2019-11-06 09:26 | Interview | 0 uur 17 minuten | 00013965 | Klaprozenweg, 47 - 1A, 1032RX, AMSTERDAM | Interview |
| <input type="checkbox"/> | 24,00 | 15,39 | 37,00 | ABEK | 2019-11-06 09:50 | 2019-11-06 10:26 | Interview | 0 uur 15 minuten | 00014390 | Meerkoet, 26 - , 1511KT, OOSTZAAN | Interview |
| <input type="checkbox"/> | 9,60 | 5,63 | 37,00 | ABEK | 2019-11-06 10:36 | 2019-11-06 11:12 | Interview | 0 uur 15 minuten | 00014378 | Goetharstraat, 33 - , 1504JL, ZAANDAM | Interview |
| <input type="checkbox"/> | 2,40 | 1,96 | 37,00 | ABEK | 2019-11-06 11:14 | 2019-11-06 11:50 | Interview | 0 uur 15 minuten | 00014371 | Brandaris, 15 - A, 1503CA, ZAANDAM | Interview |
| <input type="checkbox"/> | 4,80 | 3,25 | 37,00 | ABEK | 2019-11-06 11:55 | 2019-11-06 12:31 | Interview | 0 uur 15 minuten | 00014375 | Pannerodstraat, 171 - , 1503XN, ZAANDAM | Interview |
| <input type="checkbox"/> | 2,40 | 1,88 | 37,00 | ABEK | 2019-11-06 12:33 | 2019-11-06 13:09 | Interview | 0 uur 15 minuten | 00014376 | Twiskeweg, 34 - , 1504AD, ZAANDAM | Interview |
| <input type="checkbox"/> | 2,40 | 1,36 | 37,00 | ABEK | 2019-11-06 13:12 | 2019-11-06 13:48 | Interview | 0 uur 15 minuten | 00014377 | Smitsven, 14 - , 1504AM, ZAANDAM | Interview |
| <input type="checkbox"/> | 16,80 | 12,35 | 37,00 | ABEK | 2019-11-07 08:16 | 2019-11-07 08:52 | Interview | 0 uur 15 minuten | 00014379 | Wibaultstraat, 25 - , 1505CA, ZAANDAM | Interview |
| <input type="checkbox"/> | 7,20 | 3,07 | 37,00 | ABEK | 2019-11-07 09:00 | 2019-11-07 09:36 | Interview | 0 uur 15 minuten | 00014368 | Skager Rak, 28 - B, 1501AZ, ZAANDAM | Interview |
| <input type="checkbox"/> | 2,40 | 1,68 | 37,00 | ABEK | 2019-11-07 09:38 | 2019-11-07 10:14 | Interview | 0 uur 15 minuten | 00014369 | Burg Ter Laanstraat, 114 - , 1501TM, ZAANDAM | Interview |
| <input type="checkbox"/> | 14,40 | 8,33 | 37,00 | ABEK | 2019-11-07 10:28 | 2019-11-07 11:04 | Interview | 0 uur 15 minuten | 00014382 | Archangelstraat, 11 - , 1506NP, ZAANDAM | Interview |
| <input type="checkbox"/> | 19,20 | 11,23 | 67,00 | ABEK | 2019-11-08 08:19 | 2019-11-08 09:24 | Interview | 0 uur 27 minuten | 00014388 | Westerstijfemakersdijk, 21 - B, 1511BA, OOSTZAAN | Interview |

Figure 1: Result of route optimization within Link2Office

Furthermore a graphic presentation of the addresses on a map is available (see figure 2):

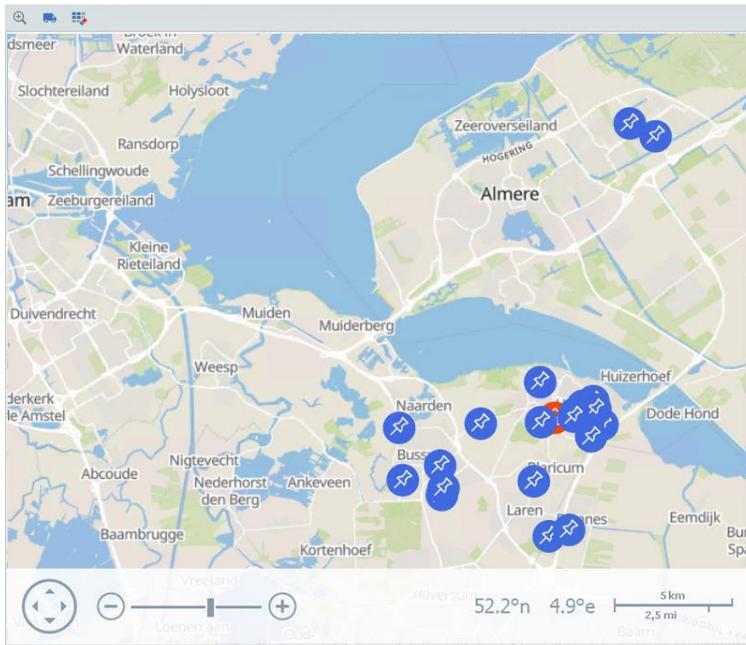


Figure 2: Graphical representation of address assignments for 1 interviewer (Link2Office)

Next step in this process is approval of these assignments, after which two separate things happen:

1. The addresses become available on the mobile device of Link2 via synchronization (see figure 3)
2. A custom made interface fills the CMA_ForWhom field in the Launcher database of Blaise CAPI. This enables synchronization to the mobile devices within the CMA application (see figure 4).

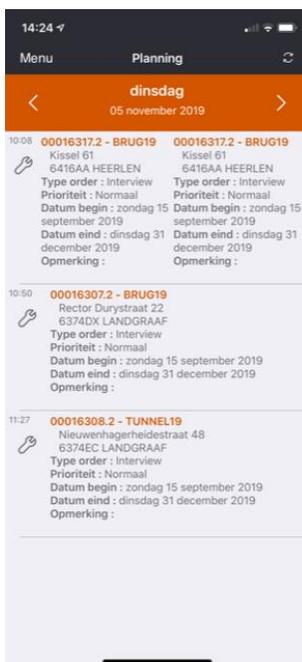


Figure 3: Addresses on Link2Mobile after synchronization

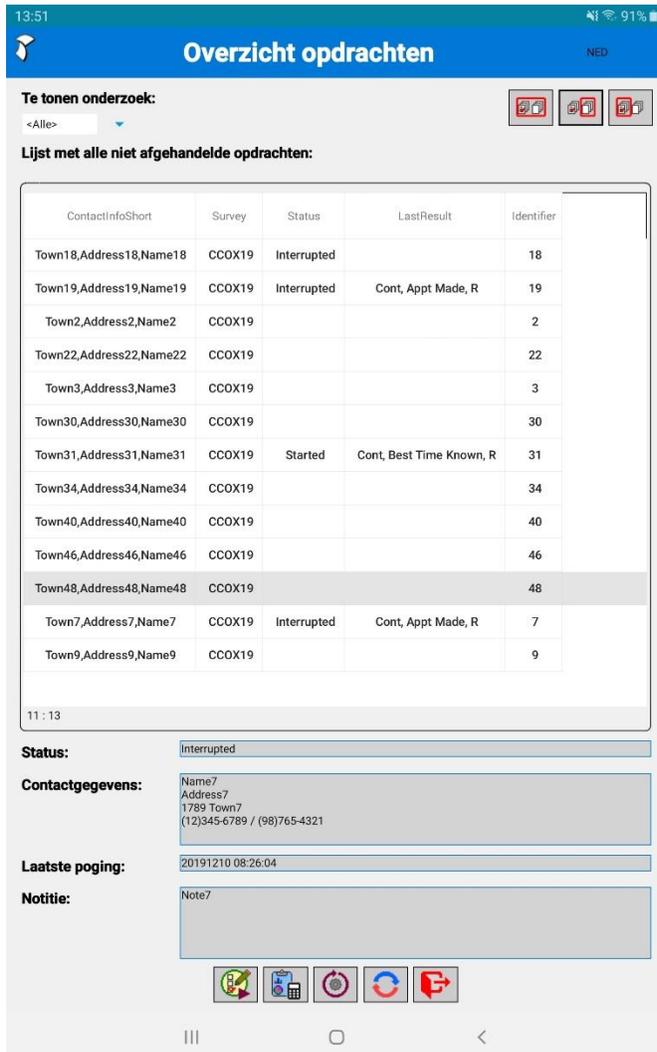


Figure 4: Overview of Addresses in CMA after synchronization

4. Process description: interviewing process

After these synchronizations to local devices the actual interviewing process can commence. As stated above (Business Case) Statistics Netherlands has chosen to use Link2Mobile to alleviate the interviewer's efforts in timekeeping and expenses. Once the interviewer has selected a specific address in his list, he can start measuring his travel time and distance by clicking (see figure 5): through GPS the road travelled is being kept by the system. After arrival at the desired address the system asks whether the kept number of kilometers is correct. By clicking on 'work' the worktime on the interview-task starts. Again, after clicking once more on 'work' the worktime on this task ends (see figure 6). At the end of an interview-task (regardless of the outcome) the task can be closed and reported to the central system by choosing the appropriate reason code (see figure 7)

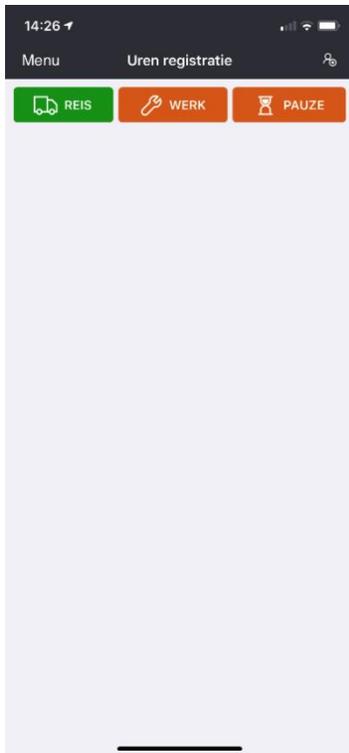


Figure 5: travel time keeping

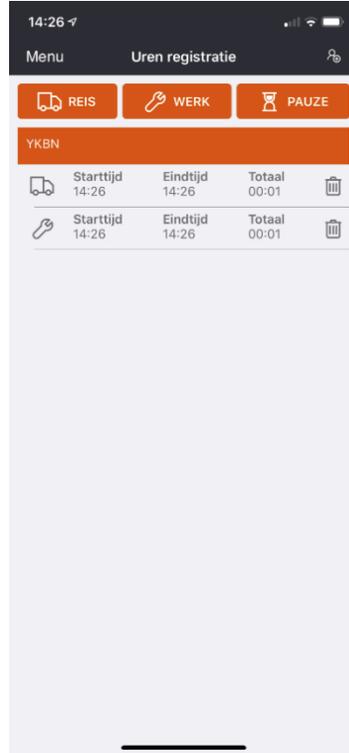


Figure 6: result time keeping

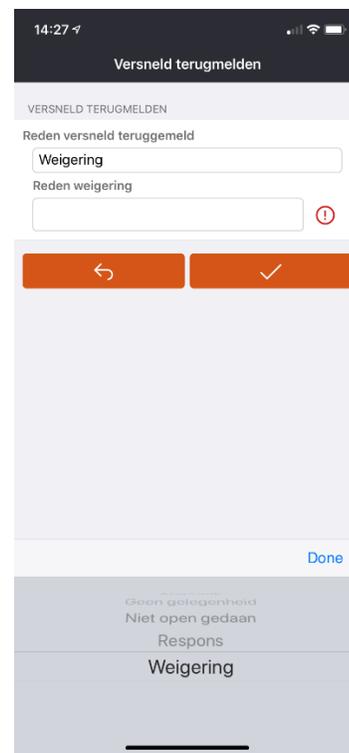


Figure 7: end result visit

Apart from the amount of time saved by using this functionality (and not having to repeat all administration at home at night), the additional advantage is that the interviewer can do all of this on his mobile phone, without having to open laptop or tablet. These bulkier devices are only needed once the respondent agrees to conducting the interview at this moment. In this case the interviewer starts (or opens) his interview device, opens CMA, selects the appropriate address (see figure 4) and clicks on the 'start interview' button (first on the left). After this, CMA opens the selected questionnaire (figure 8)

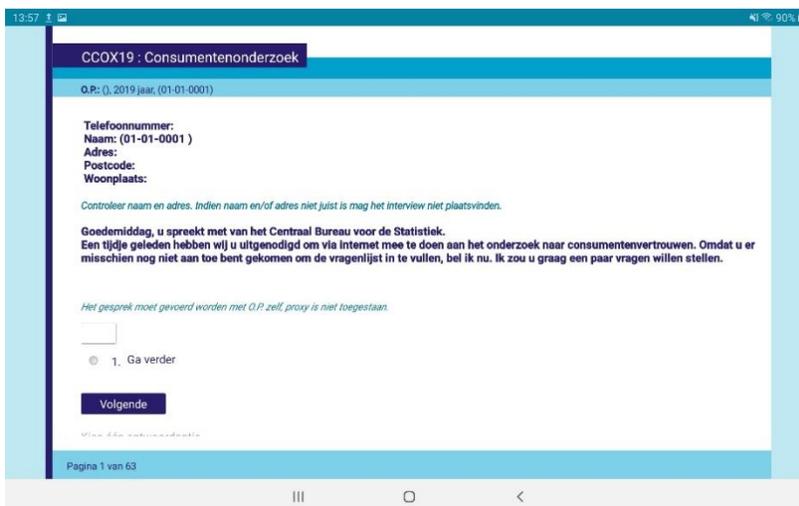


Figure 8: First page of consumer survey

5. Process description: synchronization of end results

Both Link2Mobile and CMA have standard (built in) functionality to synchronize the outcome of a visit to respectively LinkOffice and the Blaise Server Farm. From there the other standard components in the Phoenix landscape are notified (in the same way as it is done for CAWI and CATI channels).

One challenge remains: what happens to the assignments within CMA if a non-response happens at the door? In this case the interviewer hasn't even opened his CMA device and handles the non-response only on Link2Mobile (see figure 7).

CMA has a possibility to handle this: it is similar to the process of re-assigning addresses to another interviewer in case of illness of the original interviewer. In the central CMA database an address can be given an 'transfer required' status. Records with this status will be erased from the local device of the interviewer fallen ill. The only dependency in this process is that the first interviewer has to trigger a synchronization action. In case of illness the record will be transferred to another interviewer, in case of a non-response within Link2Mobile the record will receive an endstatus. Both endstatus and 'transfer required' status will be set through an API update on the central database.

6. Conclusion

Conceptually the combination of Blaise and CMA on the one hand and Link2 on the other serves the business needs as well as the architectural wishes of Statistics Netherlands. The CAPI channel will be implemented through the combination of two COTS products, with a minimum of custom made components. I am sure that we can communicate a successful implementation on the next IBUC.