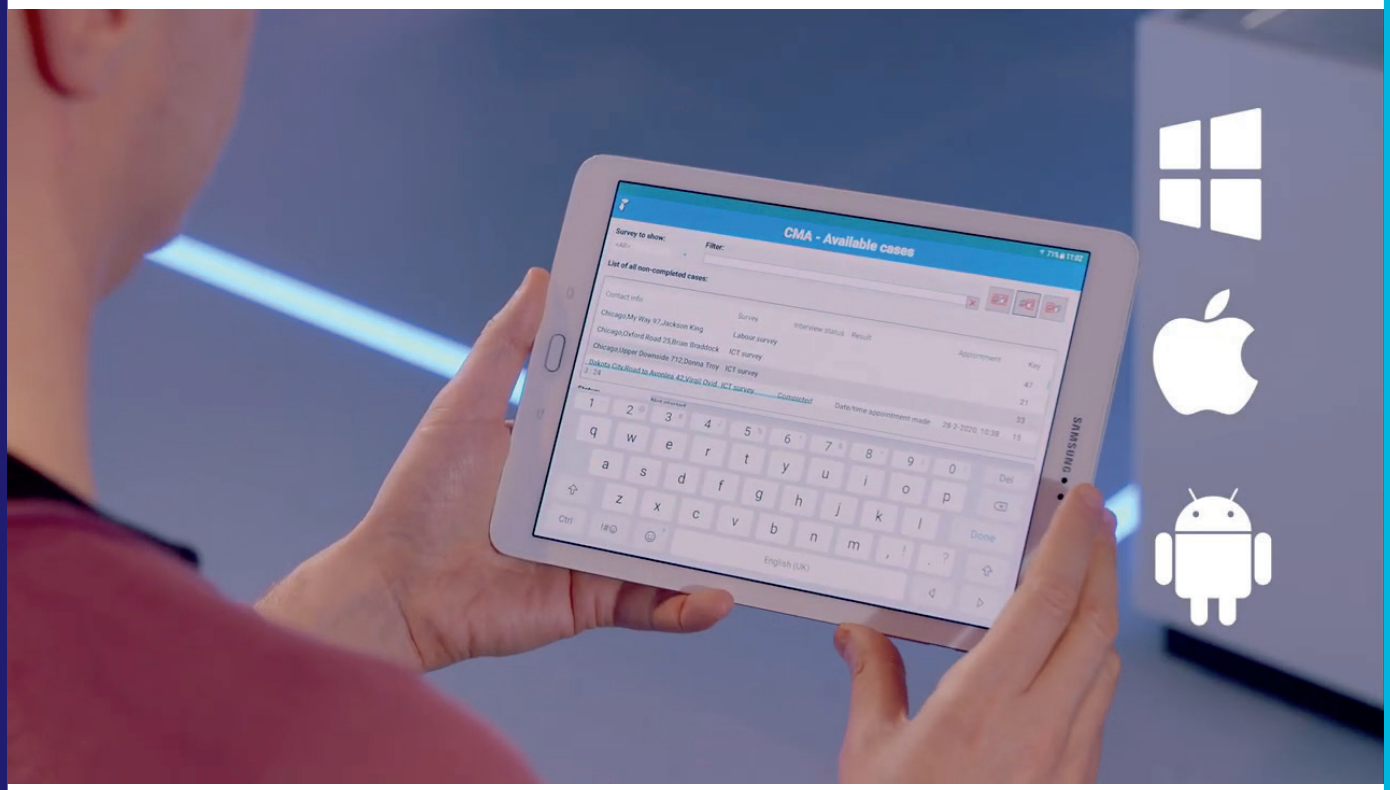
Blaise

CMA

A Case Management Application for mobile devices



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September 2020

Introduction

There is a long Blaise history of CAPI case management applications for interviewers on client devices (laptops). Blaise, however, never got into setting up a CAPI case management tool for out-of-the-box usage like Blaise did for telephone interviewing. Blaise always said that they were not planning such a tool because they expected that it would be difficult to standardize how interviewers work across organizations. In addition, Blaise was also not offering any data communication solution, which is essential for CAPI. So everyone was on their own and had to come up with their own solutions. The only thing Blaise did is offer a tool that could be used to build an interactive application to handle cases and start interviews on laptops: Maniplus. Some organizations used this tool, but others used, for instance, the Blaise API to implement their own system. Statistics Netherlands used Maniplus to build their Ilse system and Michigan used PowerBuilder and the Blaise API to build their SurveyTrak system. Both had to set up their own data communication system between the office and the laptops. It is less problematic for larger organizations to invest time and money in setting up such systems than it is for smaller organizations. So the need for an out-of-the box solution remained.

Since the early days of Blaise many things have changed in the survey world and also in Blaise. Internet is now the way to communicate with interviewers and there are now also two other operating systems for data collection supported by Blaise 5 besides Microsoft Windows: Android and iOS.

By now, Blaise 5 offers a Data Entry App (from now on just called the App). Blaise 5 offers three almost identical applications, one for each of the three supported operating systems. The App can be used by interviewers to download surveys and to download and upload data. Also, if setup correctly, the App offers per survey some basic case management functionality when using the so-called off-line CAPI block in the survey instrument.

The App is survey oriented. The interviewer selects a survey from a list of available surveys and for the selected survey the interviewer then sees a list of cases and for each case the survey instrument can be started. If the interviewer has only one survey running in the App then it is easy to see the work load, but when the interviewer has to work on multiple surveys at the same time it is somewhat more difficult: the interviewer is not presented with an overview of the total workload across all surveys. Although the case management in the App is relatively basic it turned out to be sufficient for some. Some organizations decided to extend the App themselves by using the starter-kit and the Blaise team received request for adding new functionality to the App. Some requests were implemented and some were not.

As early as 2016 Gina took the initiative to make a specification for what she called CMA. In her specification CMA stands for Case Management App. At that moment it could only be implemented by using the starter-kit. In 2019 there was a new initiative by Gina and then Blaise decided to help implement CMA. There was also an internal need at Statistics Netherlands for case management for interviewers (in the Phoenix project) and Blaise was asked for help. They received the Gina specification and they commented on it.

Based on their comments team Blaise decided to not apply the specification from Gina strictly-as-provided. The most important changes compared to the specification from Gina are:

- CMA should do things automatically when possible. For instance, installation / de-installation of a survey should be triggered by the cases for the interviewer using CMA.
- Its hould be possible to see all cases for all surveys in one list in CMA.
- The strong wish to keep the implementation as agnostic as possible from the surveys and to shift as much as possible of the organizational specific wishes to CMA-specific datamodels

Based on the then known specification, a design of the architecture was made. It uses the available data communication functionality of Blaise 5 across the internet as used by the App.

The next step was to make a decision on how to implement this. There were basically three options:

- Extend the Data EntryApp.
- Use the starter-kit to extend the functionality of the Data EntryApp.
- Use Manipula Dialogs to implementCMA.

The first option is something only team Blaise can do, the second option is something that a C#-developer can do and the third option is something that a Manipula expert can do. We decided to go for the third option. Manipula Dialogs was introduced in Blaise 5.5 and is available on all three operating systems. The main reason for choosing Manipula Dialogs is it would then be possible for Blaise users to change / extend CMA by using only Blaise tools.

When choosing Manipula Dialogs as the platform to implement CMA, it was already known that some additional functionality had to be implemented in Manipula. For instance, Manipula has to be able to download and install surveys, to be able to download and upload data, to be able to detect if there is an internet connection etc. Some of this additional functionality was implemented for Blaise 5.6, 5.7 and 5.8. Blaise also had to make sure that a Manipula Dialogs setup runs within the App on all three operating systems.

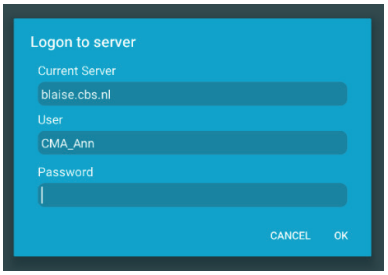
In this paper we present the current status of CMA. Note that we decided to change what A in CMA stands for. It is no longer stands for App but it now stands for Application. The reason: many thought Blaise was implementing CMA as a new native App. That was and is not true. Blaise is developing a Manipula Dialogs setup that can run in the Data Entry App. So not a new native App but an application that runs in the native Blaise Data Entry App. So to be able to run CMA on a client device the Data Entry App needs to be present.

CMA for the interviewer

We will now give an impression of how CMA looks and what the interviewer can do with it. Later we will share details of the implementation.

The interviewer starts the Data Entry App on the device. When the device is connected to the internet the App will ask for the user credentials. An example can be found on screen 1. Note that all screens are made on an Android device in landscape mode.

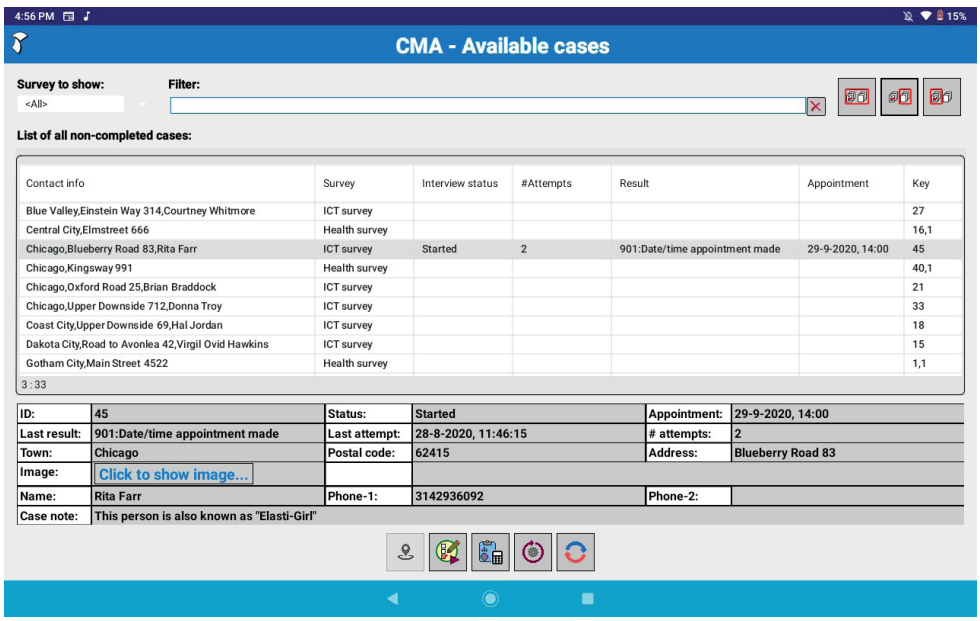
Screen 1. Login to the Blaise Data Entry App



When CMA is not already present CMA will automatically be downloaded, installed and started without the interviewer needing to do anything. If already present, the App will update CMA when an update of CMA is available at the server.

When started, CMA first performs a synchronization with the office server. During the synchronization, available cases and surveys will be downloaded. Next, CMA will show the main screen: the cases overview screen. See screen 2.

Screen 2. The cases overview screen.



The middle part of the screen shows the available cases in a list. Below the list, detail information about the selected case is displayed. The controls on the upper part of the screen can used to influence what cases are displayed. Various views are supported. The views can be set by clicking one of the 3 buttons on the right top of the screen, by selecting an entry in the *Survey to show* dropdown box on the top left of the screen and by entering a value in the filter text box. The bottom part of the screen displays a number of action buttons.
The cases lister shows the cases in the current view. The cases are sorted on the first column that displays the contact information. The last appointment registered in an attempt for the case is displayed in the *Appointment* column when still current (for today or in the future).

When pressing the right-hand button all handled cases will be displayed, when pressing the middle button all not handled cases will be displayed and when pressing the left-hand button all cases will be displayed. The middle button is the default. A text that describes the currently active selection is displayed above the list with cases. The selected button has a thick black border.

The *Survey to show* dropdown box shows all available surveys installed on the device for all cases on the device. By selecting the top most entry <All>, the cases for all surveys for the current user will be displayed.

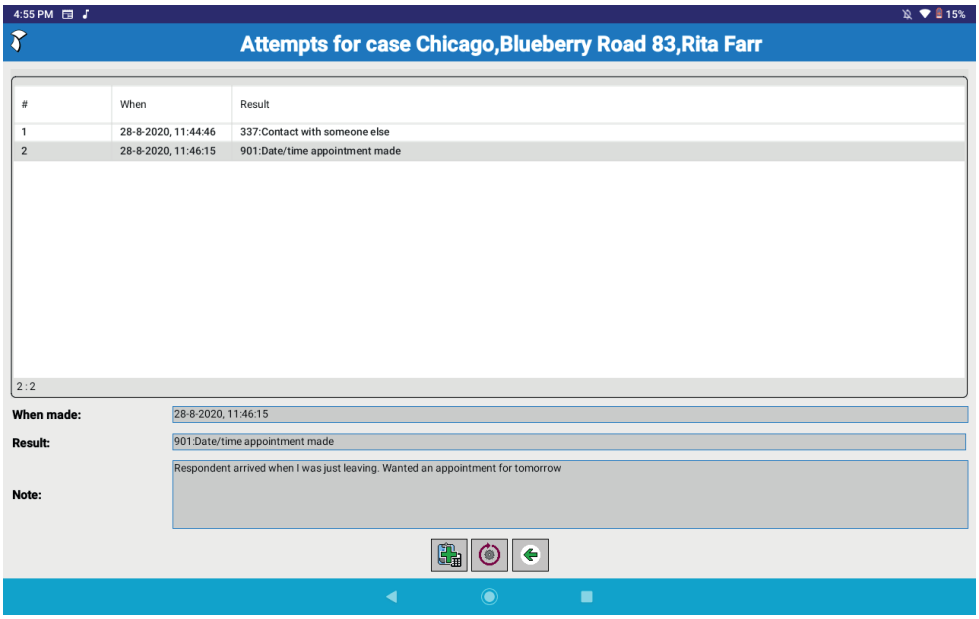
It is possible to filter the cases by entering a text in the filter text box. The filter text is used on the contact info as displayed in the first column. Only the cases that contain the filter text as a substring in the contact info are displayed.

The interviewer selects the case that needs to be worked on in the list and then clicks one of the first four action buttons:

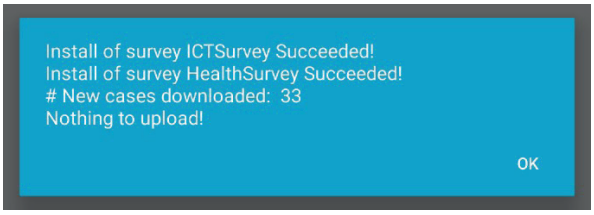
- Create a case. This button is only visible if the current case allows the creation of additional cases.Forinstance, when there is a listing survey or a survey for which all households at an address need to beinterviewed.
- Start interview. When clicked, the interview is started after confirming that this is really needed. This button is always visible. It is disabled (grey) for a handled case. When the interview is completed or interrupted, CMAwill automatically start the attempts survey. This survey is used to account the interview.
- Show attempts. This button is always visible and enabled. When clicked, the show attempts screen is displayed. This dialog can be used to enter a new attempt. See screen 3. The details information shows the appointment if one has been specified when registering theattempt.
- Edit case. When clicked, the Launcher datamodel is started. That model can be used to allow editing of the contact information and to enter / edit the case note. This button is always visible. It is disabled (grey) for a handledcase.

The fifth action button is to start the synchronization with the office server. This button is always visible and enabled. When clicked a synchronization with the office server is performed. The result of this action is displayed to the interviewer. See screen 4.

Screen 3. The attempts overview screen.



Screen 4. Example of the synchronization result.



Under Windows there is a sixth button to quit CMA. Under Android the interviewer uses the back button to leave the application. When leaving, CMA will prompt the interviewer for synchronizing.

CMA behind the scenes

When designing CMA we decided to setup one database at a server at the office that handles the cases for all surveys for all interviewers. This resembles the launcher that Blaise 5 implemented for CATI in 5.6. We decided also to reflect on what Mark Pierzchala was implementing for the Choréo system (Multi-Mode Management system). Choréo implements a launcher also. The database in CMA is also called launcher. The launcher database is defined through the CMA-launcher datamodel.

The launcher database keeps track of what happened to each case. Each case knows for what survey it is (in Blaise a survey is uniquely identified by a GUID), what the primary key is within the survey and for which interviewer the case is. It also contains the contact information the interviewer needs to handle the case. When a case is downloaded by

CMA that is running on the device of an interviewer, then this is registered in the launcher database at the server. When a case has been completed by the interviewer then this is registered in the launcher database on the device and after a synchronization also registered in the launcher database at the office. The launcher database at the office has all the information needed to monitor the progress of the field work, but it can only do so when CMA is allowed to frequently synchronize with the officeserver.

CMA uses a datamodel to allow the interviewer access to the contact information that is store in the case in the launcher database. The interviewer can make a note and enter additional information like a telephone number using thecontact information datamodel. The contact information datamodel can be survey specific.

We decided that all aspects of the accounting of the work done on a case by an interviewer should be done by using a separate Blaise datamodel. We called this the Attempts datamodel. For each case the interviewer can enter one or more attempts. The attempts datamodel implements the outcome code for a case. To allow organizations to have their own outcome code for a case we decided to make a loose coupling between the launcher and the attempts. The launcher registers the label of the selected outcome code and the text describing the label. Based on a value set by the attempts, CMA knows when a case is completed for upload to the office server. In the Attempts datamodel shipped with CMA the outcome code is based on a very extended list with happenings that is implemented in Choréo.

The attempts survey is used to allow registration of attempts for a specific case by the interviewer. The attempts datamodel has a number of fields that have a certain role in CMA. The attempts datamodel is started automatically after an exit of the topic instrument or it is started directly by the user of CMA to register an attempt. CMA allows for a survey specific attempts datamodel.

When starting the attempts datamodel in CMA a number of fields are passed to the data entry session. The attempts datamodel then knows, for instance, if attempts was started as a result of an interview or if it has been started directly by the interviewer and it knows the status of the case. The attempts datamodel communicates to CMA whether the case is closed and what to display in the case lister.

The organization that uses CMA is allowed to customize the datamodel while making sure that what needs to be communicated to CMA is being done. It is also possible to set up a specific attempts datamodel for a survey. In this case the GUID of that datamodel needs to be specified in the survey settings file or in the case in the launcher.

The cases which are available for download for a specific interviewer are determined by the download interceptor that is defined for the Launcher datamodel. Based on the name of the user of CMA that is requesting the download, the appropriate case are provided to CMA. The download interceptor also informs CMA of cases that need to be transferred to another interviewer, cases that can be released and cases that need to be restored.

When starting CMA and when pressing the Sync button on the cases screen, a synchronization with the server will be executed. During the synchronization various things happen:

- CMA downloads data for the launcher survey. The download interceptor delivers the cases specific to the user that did the login in the App. The download can result in 0 or more cases. When not zero, CMA first checks what surveys are needed to handle the cases and downloads and installs the surveys that are not yet present on the device. All downloaded cases are stored in a local database on the device. For each case, survey data and attempts are also downloaded from the server, ifavailable.
- A downloaded case can contain the request to transfer a case. In this case the case is uploaded, including the collected data and attempts. The caseis then removed from the client because it no longer belongs to the current interviewer.
- Case that are labelled as Final are uploaded, including the collected survey data and attempts. The case and the attempts remain read-only available on the client until they arereleased.
- The application checks for missing surveys (a missing survey can occur when cases have been downloaded to the device in a previous session and at that the moment the survey was not yet installed on the server) and it also checks for surveys that are installed on the device but for which a more recent version is available on the server. If present and needed, surveys are downloaded and installed on the device.
- Upload of the logging of CMA when not already done on the currentday.
- Optional. When all cases of a survey have been handled and synchronized the survey will automatically beremoved.
- Optional. All data of cases that have been changed since the last synchronization will beuploaded.
- Optional. All cases that have an end date in the past will bereleased.

Synchronization will be done after an attempt has been added and when closing CMA using the Quit button but only if an internet connection is available. When starting CMA a synchronization will be done, but again only if an internet connection is available.

The future

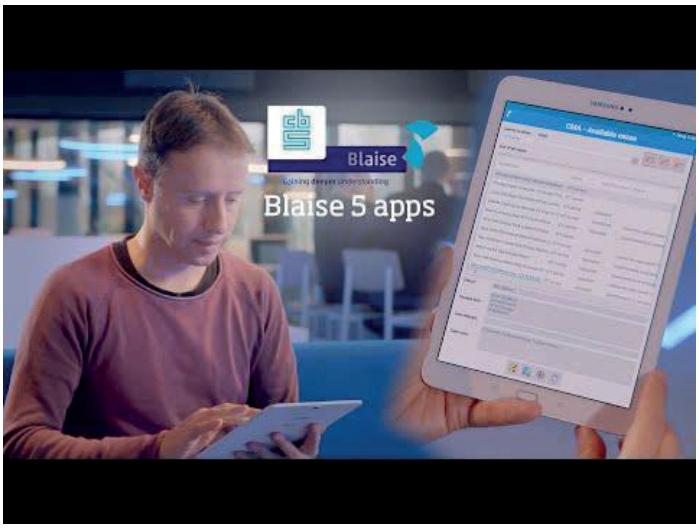
CMA is available for production since the releaseof Blaise 5.8.2. Based on feedback and emerging project needs CMA will be extended. There is small list of possibleextensions:

- Add a trainingsmode.
- Allow for linked surveys. This is a survey that can start another survey. CMA must be enabled to download the surveys it is linkedto.

Work has started to implement tooling for setting up a survey in CMA and to handle the operation of a survey like loading cases, assigning cases to an interviewer, transferring cases and monitoring survey progress. For now, this can all be done using some simple Manipula setups.

If you would like more information, please contact Team Blaise.

About Blaise®

Blaise® is a software platform for survey data collection and survey processing, designed to handle government and scientific surveys. Stationed at Statistics Netherlands' (CBS) offices in Heerlen, a team of dedicated software engineers and survey specialists make up the heart of Team Blaise.
Together with CBS' methodologists, data analysts, questionnaire developers and survey managers, they continuously work on innovating Blaise while supporting their user community.

Watch Blaise 5 CMA in action.