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A Case Management System for Social Surveys based on the Business Process Model and Notation (BPMN) standard

Implementation and experiences at
Statistics Austria

1. Why surveys need automated and non-automated case management
2. How to standardise and automatise fieldwork?
3. Non-automated case management
4. BPMN workflows as a component of the survey service tool STATsurv

Why surveys need automated and non-automated case management (1)

- Questionnaire and sample are the most essential elements of a survey.
- For a simple survey design not much more is needed.
- However, running several surveys with complex designs simultaneously results in a considerable burden on data collection units.

Why surveys need automated and non-automated case management (2)

- Some automatisisation of the fieldwork (the “Run Collection” sub-process of the GSBPM) could help.
- However, too much automatisisation is useless or even dangerous, because
 - fieldwork should remain semi-structured human interaction!

Why surveys need automated and non-automated case management (3)

- To automatise case management helps to run surveys in an efficient way, but
 - people (respondents, interviewer, case management staff) do not always behave or react as expected!
- **Automated** case management has to be complemented by **individual, non-automated** case management for quality reasons.

- To automatise and standardise a business process and - at the same time - allow for individual flexibility is a challenge with regard to
 1. concepts (what could/should be automatised and how could that be done)
 2. IT-tools (technological implementation).

- Conceptual frame: simplify survey fieldwork to only two basic building blocks (modules), namely
 1. Data Collection Episodes and
 2. Communication Request Tasks
- **Applying these two modules allows for modelling any survey design!**

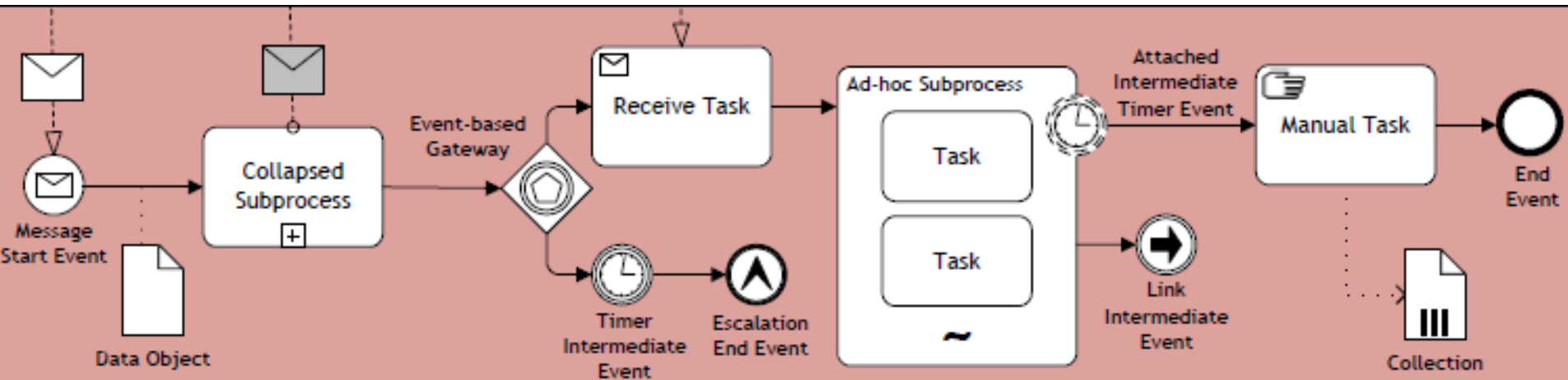
- **A Data Collection Episode ...**
 1. ... addresses a single sample unit;
 2. ... has to have a pre-defined start date and a pre-defined length or end date;
 3. ... has to have a pre-defined mode (CAPI, CATI, CAWI);
 4. ... serves as gatekeeper for access to the questionnaire;
 5. ... is either terminated actively (via some human interaction) or passively (end date reached without an active closing);
 6. ... has to have an assigned outcome category after termination.

- For any survey design the fieldwork phase for a single sample unit is always a pre-defined sequence of 1 to n Data Collection Episodes and Communication Requests.

This simplification of the fieldwork process implies that most of the human activities potentially occurring during the fieldwork phase are not controlled by an automated workflow – and that is fine so!

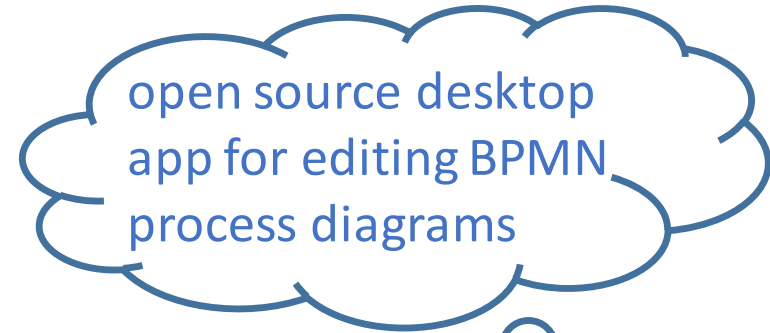
How to standardise and automatise fieldwork? (5)

- To model a sequence of tasks, a global standard for process modelling is available, the Business Process Model and Notation (BPMN).

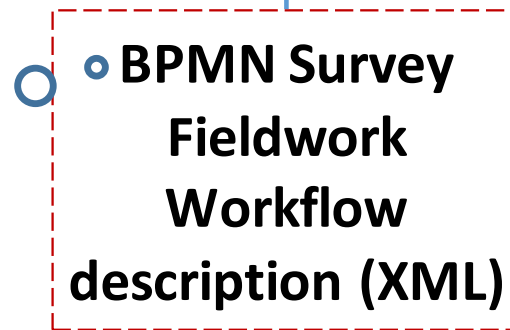
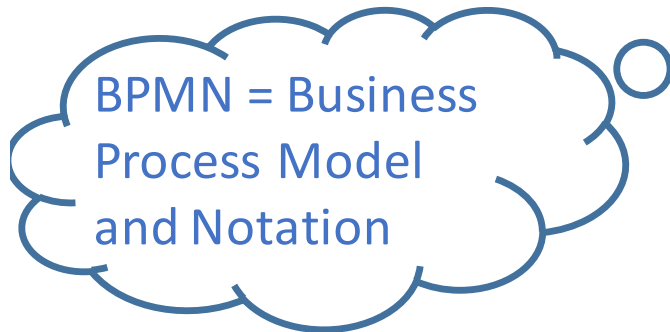


<http://bpmb.de/poster>

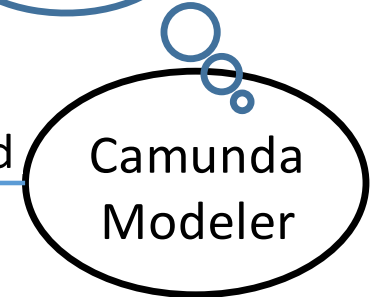
How to standardise and automatise fieldwork? (6)



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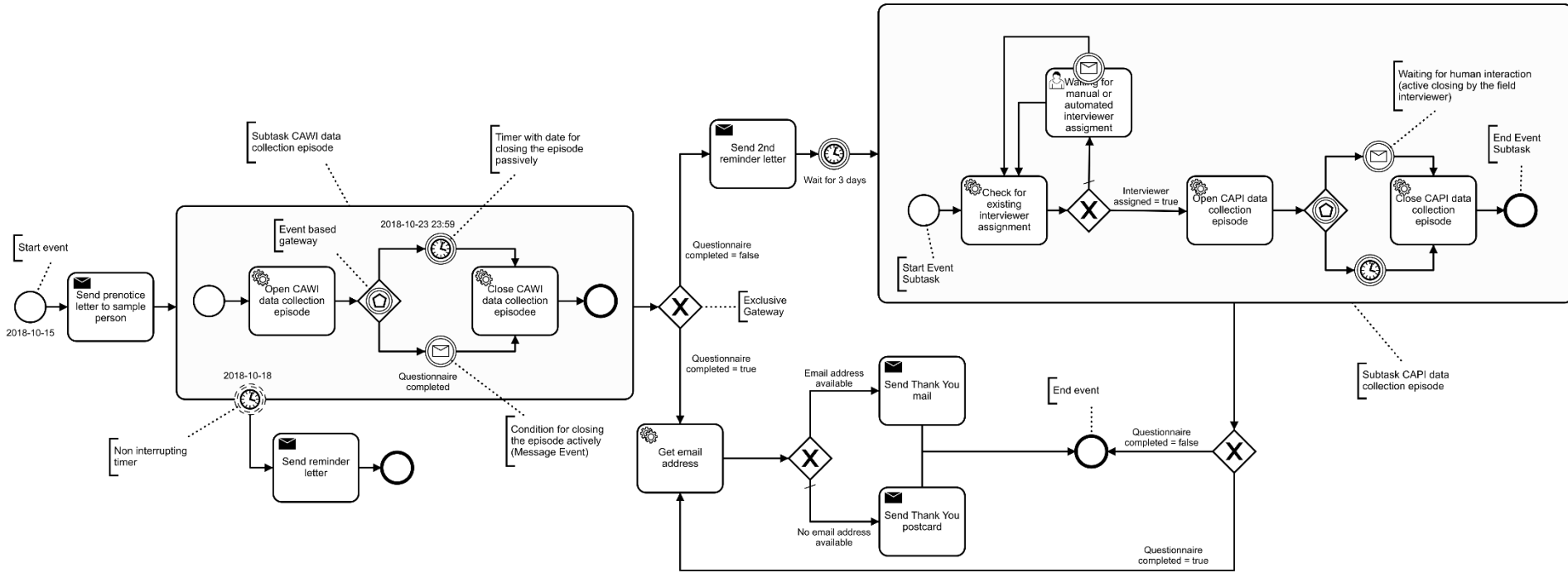
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Example of a fieldwork workflow for a CAWI-CAPI mixed-mode survey - requirements

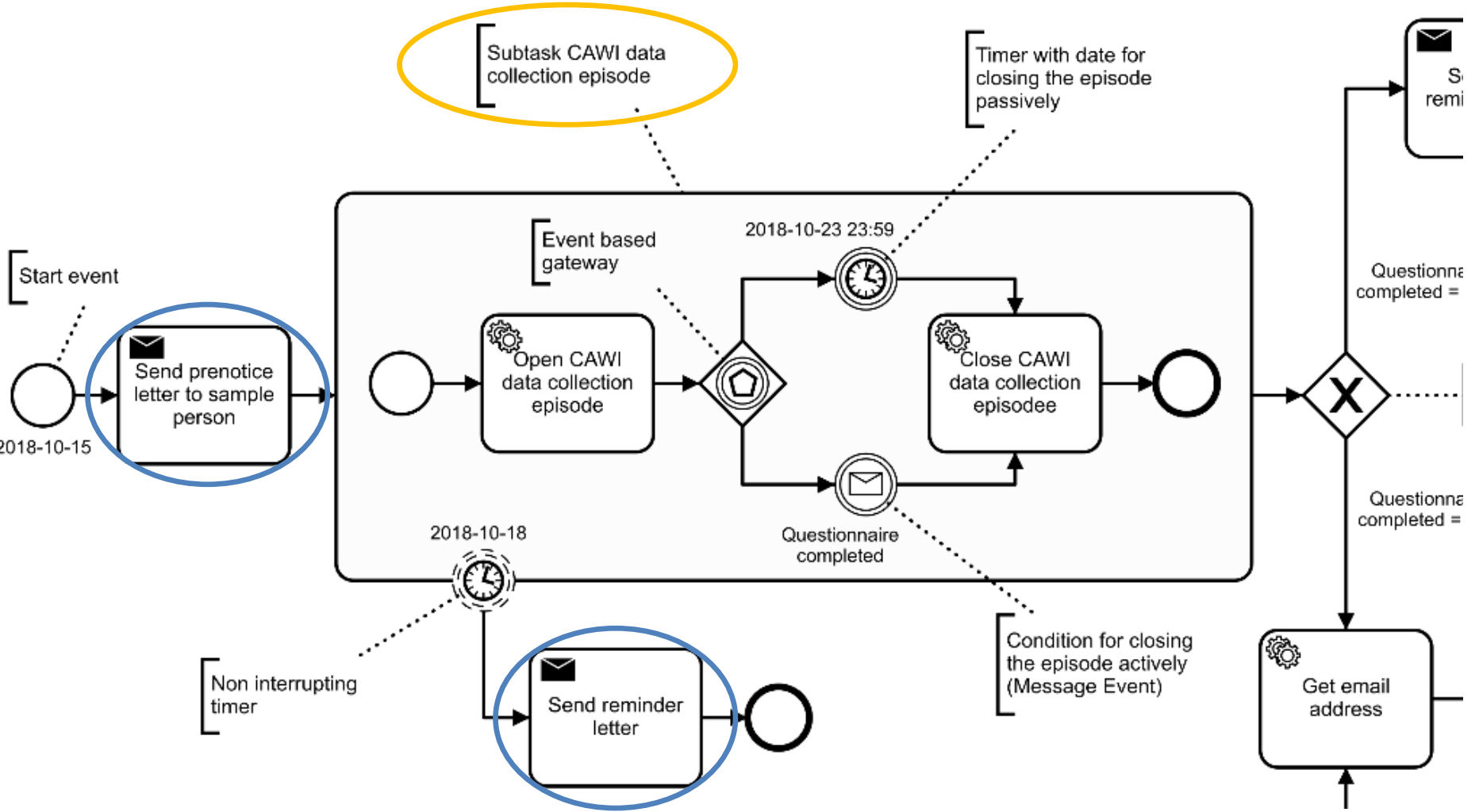
1. For all sample units fieldwork should start on Monday, 15 October 2018.
2. Send a personalised prenotification letter to a sampled person amongst others providing a web link to a CAWI (Computer Assisted Web Interviewing) questionnaire.
3. Make the CAWI questionnaire available to the sample unit.
4. If the CAWI questionnaire is not completed within 3 days send a 1st reminder letter to the sampled person.
5. A personal email address could be provided in the CAWI questionnaire. In case of completing the questionnaire, send a thank you email to the respondent. If no email address is available send a thank you postcard.
6. Disable the availability to a non-completed questionnaire after 8 days.
7. In case of not completing the CAWI questionnaire send a 2nd reminder to the respondent amongst others indicating that a field interviewer will contact him or her.
8. 3 days after triggering the 2nd reminder, the field interviewer should start contacting the respondent and trying to carry out a Computer Assisted Personal Interview (CAPI).
9. The field interviewer has a maximum of 15 days to finish his work.
10. Send a thank you postcard (or email if possible) in case of a CAPI completed questionnaire.

Example of a fieldwork workflow for a CAWI-CAPI mixed-mode survey – BPMN representation (1)



This graphical representation of the workflow (plus a XML description of the graph and the workflow) was produced with the Camunda modeler, an open source desktop app. <https://bpmn.io/>

Example of a fieldwork workflow for a CAWI-CAPI mixed-mode survey – BPMN representation (2)



- Individual, non-automated case management will always reduce cost efficiency.
- You have to define business rules and a set of use-cases to find an acceptable compromise between allowing for individual case treatment and the associated cost and burden.
- Include several pathways highly expected to occur in the fieldwork workflow → amount of manual case management could be reduced

- Implement several features for individual case management in the CAPI/CATI/Management web applications (and not in the workflow).
Example: Sending a prenotation letter once again
- Allow for some overtime for a Data Collection Episode of a sample unit by manipulating the respective timer of the workflow graph in the case management application.

- Allow for uploading supplementary fieldwork workflows (even during the fieldwork phase).
- In the Case Management Application for a single sample unit
 1. a running workflow could be stopped and
 2. a supplementary workflow could be started manually any time during the fieldwork phase.
- These features allow for high flexibility and at the same time return cases to automated management after an intervention.

- Mid 2013: start of a project for developing a new technical infrastructure for running non-business sample surveys
- Since the beginning of 2018: all social surveys (and the Job Vacancy Survey) use the new service tool **STATsurv**
- Development process started from the scratch applying agile software development with a team of about ten to twelve people (five to six software developer) \approx 60 person-years

Targets and standards for a new survey tool (1)

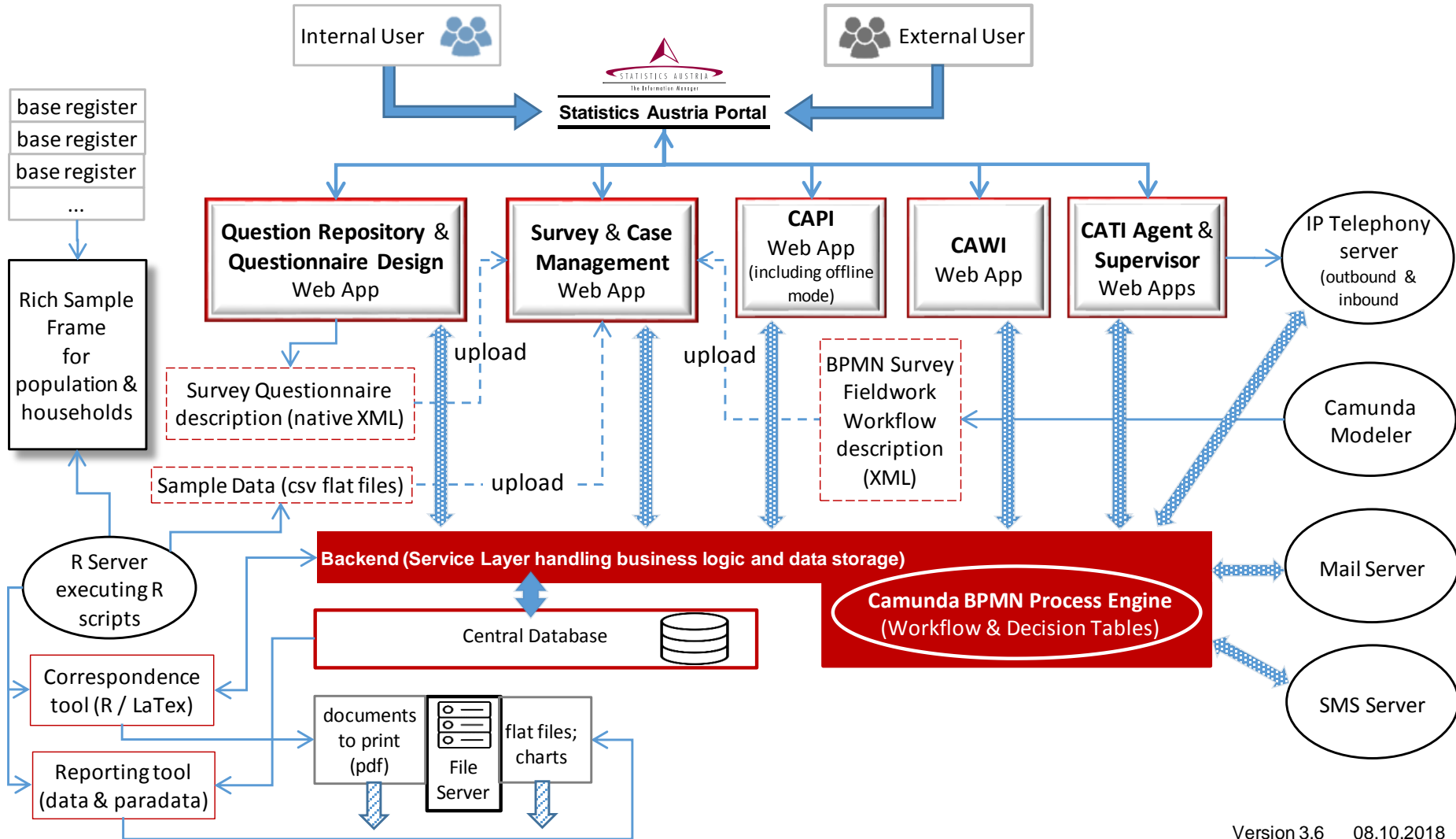
- Use web-based applications for all user interactions.
- Embed all applications in the web portal of Statistics Austria for authentication.
- Store all data in a central database.
- Involve as less IT staff as possible in launching and running a survey.

Targets and standards for a new survey tool (2)

- Provide automated and non-automated case management to run several surveys with complex mixed-mode designs simultaneously
- Promote the reuse and standardisation of questions by establishing a hierarchically structured repository.
- Design questionnaires in a browser user interface.
- Use R scripts for all features not needing a GUI.

Basic architecture of STATsurv – the “big picture”

Basic architecture of STATsurv - a service tool for running surveys at Statistics Austria



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