Business process in the context of smart surveys

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Abstract

Applying smart solutions in surveys has an impact on the logistical process. Additional attention is needed in several process activities of the statistical business process. Which additional capabilities are needed? Which process activities need adaptation? What actors are affected? Which activities can be supported by for example, micro services and machine learning modules? We will use GSBPM as a framework and give examples from HBS and/or TUS. The goal is to give you – as a statistical office – some guidelines on what is needed, in the business process, to start using smart solutions in production. In this paper we describe what the Smart Survey Implementation (SSI) project is developing. A first version will be published by the end of June on Open Social (https://cros.ec.europa.eu/dashboard/trusted-smart-surveys)

Keywords: Smart surveys, business processes, building blocks, GSBPM, BREAL

1 Introduction

One of the objectives of the Smart Survey Implementation (SSI) project is to deliver concrete guidelines that will help NSIs to extend their business process to adopt smart solutions in their surveys. Part of this is to help NSIs to model their business process and to identify the capabilities needed. Each NSI has its own situation, its own context, and its own ideas of applying smart solutions, and thus has its own process requirements. It is not feasible for WP4 to make a process model for each of these situations. So, what we have developed are process building blocks. A building block should be seen as a business process activity. The focus of the set of building blocks is the statistical production process .

In GSBPM there are two activities to build your business process: ‘Design business process’ and ‘Build business process’. The building blocks will support these activities. The idea is that an NSI can use these building blocks to model their production process. Each NSI can vary in the order of the process activities and determine which blocks appear or do not appear in the process. It can be used to model a generic process or a survey-specific process. That is up to each NSI.

And if you do not create an actual process model in your NSI, these building blocks form also a list of aspects – think of it as a checklist – that you need to address when planning to use smart solutions. To demonstrate how this works, we have also provided one business process model as an example. This shows how building blocks can be used to compose a process model.

Building blocks are non-NSI specific and have enough detail to show the 'smart' aspects. There are of course many process activities that are needed in a statistical business process, but it is too much and also not of added value to mention them as far as they are not affected with respect to smart solutions. We only looked at building blocks that are relevant for using smart solutions. These can be new activities or known activities that need extra attention.

The scope is all the GSBPM process phases up to and including the 'Process' phase. For the 'Analyse', 'Disseminate', and 'Evaluate' phases, we do not see extra process activities (in the context of smart solutions). So no building blocks are provided.
For now, the scope is limited to 'Internal sensors' smart solutions (see SSI taxonomy), and specifically HBS (NB: TUS will be included later). Therefore, we created our 'box with building blocks' (repository) based on the example of HBS. This is our way to make things as concrete as possible.

When looking at HBS we used a broad view concerning the different situations of the NSIs. This means that the set of building blocks should on the one hand be useable for a business process where the use of smart solutions is limited, and on the other hand for processes that use the full potential of smart solutions. To get this insight we looked at the different situations in the NSIs within the SSI consortium (for now only concerning HBS).

We related micro-services and machine learning models – as far as in the scope of SSI – to the building blocks. In this way, an NSI gets a clear picture of where services and models can be used in the business process.

In addition, for each building block, related actors need to be identified. For each process activity, it needs to be clear what business actor is involved. Because the actor depends also on the organizational structure of an NSI, we described the actor more in terms of knowledge/capabilities.

Process activities – in general – tell you what to do, they do not say anything about the how. So, the building blocks will not address the methodology aspects and will also say nothing about IT solutions (other than the micro-services and the ML-models that can be used). Methodology, legal but also IT will provide requirements for your business process. Methodology will also give advice about which methods work best in certain situations. E.g., there will be a building block that says that you need to ask/inform the respondent about consent. But that building block will not say how to do that.
However, we will – when applicable – mention alternative options. To this end, we also refer to other SSI results.

Based on all this, we then also look at the GSBPM and BREAL framework. We have positioned building blocks within these frameworks. In this way, we elaborated the GSBPM with the aspects that are specific to using smart solutions.

2 Building blocks

The building blocks are combined into groups. E.g., the group 'App'. The idea is that when you, as an NSI, decide to use an app in a survey, you can look at the building blocks in this group. Then these are all candidate activities to include in your process.

No strict rules were used to create a group. It is just meant to give you some structure. They are not grouped by process phase (like 'design', 'build' or 'collect') but by subject (like 'app' or 'COICOP'). Please feel free to group them otherwise to fit your needs.

The groups we use are:

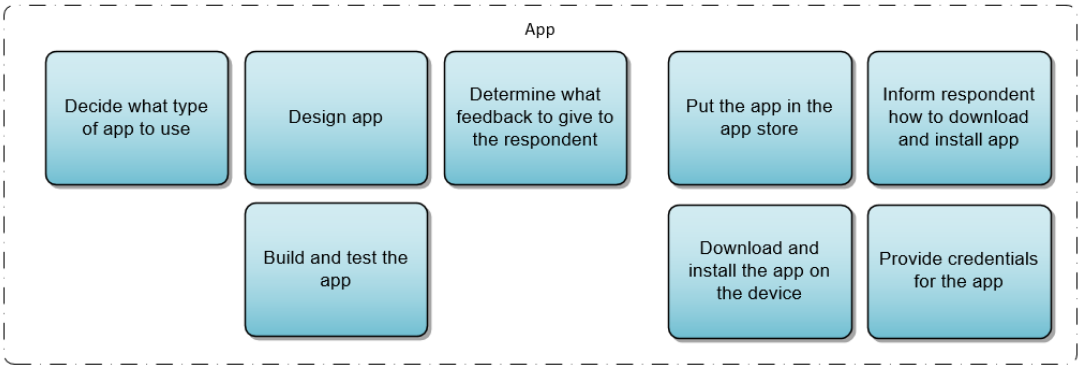
Group	Comprises process activities concerning…
App	…designing, building, downloading and installing an app
Collection strategy and communication strategy	…designing strategy and inform respondent about consent and privacy
Integrate into production systems	…the integration of the 'app channel' into the rest of the data collection landscape
Providing receipt	…scanning / uploading a receipt and entering additional information
OCR/NLP	…deploying the micro-service, OCR/NLP the receipt, involvement of the respondent in this
OCR/NLP model	…the training / updating of the OCR/NLP model
Shop and product lists	…maintaining shop and product lists
Diary	…filling the diary with the individual receipt information, determining the moment of respons
Interviewer	…the role of the interviewer
Data processing	…processing activities
COICOP	…classifying to COICOP
COICOP model	…the training / updating of the COICOP model
Helpdesk	…the role of the helpdesk
Monitoring and analysing	…the monitoring and analysing of the process and the app usage

Remark: Several building blocks are specific for HBS, others are generic for smart solutions. We did not make that distinction yet. When we will look at TUS and energy donation (in the next phase of the SSI project), we will get a clearer view of what are generic process activities and then we can make the distinction explicit.

Everything starts with the question what smart solution you would like to use in a certain survey. This depends on the needs (see GSBPM 'Identify needs') and on the possibilities (financial, IT, etc.) you have as an organisation. Also the level of maturity of your organisation regarding applying smart solutions plays a role: to use a smart solutions for the production of statistics you need to be at a certain maturity level (see the SSI maturity model).

2.1 An example: building blocks for the group App

When you decide to use an app for your smart solution, the following building blocks are relevant.



For each building block, a description will be provided, including some guidelines and the actors involved. In the next paragraphs some example are shown.

2.2 Determine what feedback to give to the respondent

When using an app, this is an important decision to make. E.g., in HBS there are a few feedback options:

- Feedback on the quality of the photo (when quality is too low: take new photo)
- Results of OCR scanning
- Results of COICOP classification
- Return nothing

This decision has a considerable impact on the business process and the IT architecture. When OCR results are returned then the OCR model should be available. In addition, extra IT challenge arises if the app should also be able to work in an offline setting.

The classification of a receipt text into a COICOP category is normally an activity in the ‘Process’ phase (see GSBPM). However, returning COICOP results to the respondents requires a more or less real-time feedback. This requires that the COICOP model is available for the app, and may be even on the device.

Studies suggest that you do not want to give feedback on the 4th or 5th level of COICOP. So, this supposes two ‘versions’ (our outcomes) of the COICOP algorithm: on the most detailed level (as output for the statistics) and on a higher level (to return to the respondent).

Actor: Methodologist, Process architect, IT architect

2.3 Build and test the app

Based on the design (and related decisions) the app should be built. Also functionality and usability testing are part of this activity.

Some NSIs will build the app themselves, others will use an external supplier and others will (re)use an existing app. Another option is for NSIs (and/or other parties) to jointly build and maintain the app.

In the first case, an NSI should have app developers and app testers available. Also, you need specific development tools. This can have quite an impact on the organisation.

Regardless of the choice your NSI makes, you need to think about the governance of your app management. The type of governance required depends on the relevant option as mentioned above, and on the other hand also depends on the maturity level of the NSI (see SSI Maturity model).

Actors: app developer, UI/UX designer, app tester, application manager

2.4 Put the app in the app store

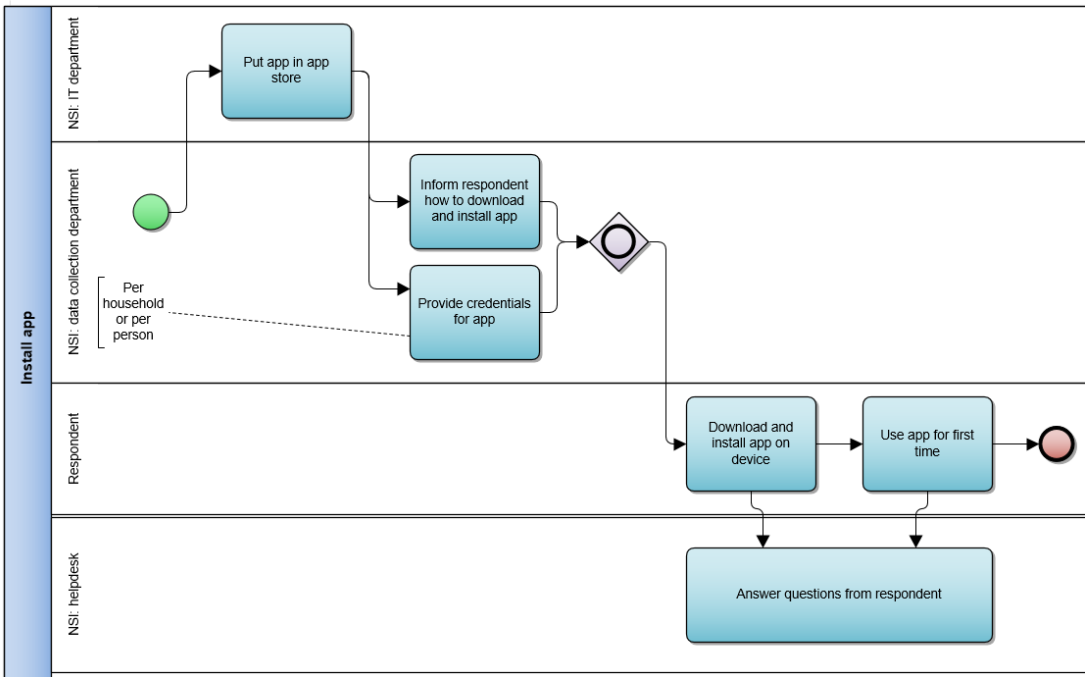
The developed app should be made available at a location where the app can be downloaded by the respondent. For Android and iOS, there is a different app store.

You should also think of managing the versions of the app in the app store. E.g., when there is a new version, will you also keep the old version? Should a new version only be put in the store between two collection cycles? And how do you deal with bugs? Do you address critical bugs only after the end of a collection cycle or can you release new versions in between. And how does that affect your final result. These questions do not have an obvious answer and should be thoroughly thought through.

Actor: application manager, IT department

3 Business process example: install app

The building blocks can now be used to design the business process model. For example, in all smart surveys where an app is used, the app needs to be installed on the user's device. In the example below, the business process model of installing the app is modelled using the building blocks. Note that in the SSI project deliverable, many more examples are provided, also specific for the HBS and TUS processes.



In this example, the data collection department triggers the process. They tell the IT department to put the app in the app store. When that is done, the data collection department informs the respondent how to download and install the app and they will also provide the credentials for the app to the respondent. This could be done by putting all this information in the invitation letter.

Then the respondent can download and install the app and use the app for the first time. For help, the respondent can contact the helpdesk. So, apparently, in this example, the interviewer has no role in helping the respondent.

4 Link to GSBPM and BREAL

Within the statistical environment, the GSBPM and BREAL are generic frameworks for designing business processes. The building blocks are more on a detailed level and can be assigned to related to a GSBPM sub-process and BREAL function. The table below shows a first mapping of this.

Process activity / building block	GSBPM phase and sub-process	BREAL function
Put app in app store	Build: 3.7 Finalize production systems Collect: 4.2 Set up collection	Deployment
Inform respondent how to download and install app	Collect: 4.3 Run collection	
Download and install app on device	Collect: 4.2 Set up collection	
Provide credentials for app	Collect: 4.3 Run collection	
Provide photo of receipt	Collect: 4.3 Run collection	
Upload e-receipt	Collect: 4.3 Run collection	
Answer additional questions about receipt	Collect: 4.3 Run collection	
…		
OCR the receipt	Collect: 4.3 Run collection	Data representation
…		
Create and test OCR model	Build: 3.1 Reuse or build collection instrument	Modelling and interpretation
Update / train OCR model	Analyse: 6.2 Validate outputs Build: 3.1 Reuse or build collection instrument	Modelling and interpretation
…		
Make data from questionnaire available for data processing	Collect: 4.4. Finalise collection	-
Make data from diary available for data processing	Collect: 4.4. Finalise collection	-
Integrate	Process: 5.1 Integrate data	Integrate survey and register data
Classify to COICOP (automatically)	Process: 5.2 Classify and code	-
Classify to COICOP (manually)	Process: 5.2 Classify and code	-
Redirect COICOP to respondent	Collect: 4.3 Run collection	-
…		
Train helpdesk employees	Collect: 4.2 Set up collection	Support statistical production Human resource management
Answer questions from respondent	Collect: 4.3 Run collection	Support statistical production

References

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