# SOURCE™ - Software Outreach and Redefinition to Collect E-data Through MOTUS

## Towards a Modular Online Time Use Survey

### Introduction

The coordinator of this project was Statbel, the Belgian statistical office and the beneficiary was Destatis (Statistisches Bundesamt), the German statistical office. As a subcontractor the company hbits CV (www.hbits.io) as a Spin-Off of the Vrije Universiteit Brussel (Belgium) was appointed.

The general goal of this project was to get to know more about the MOTUS software platform, which is a continuous development of the Research Group TOR of the Vrije Universiteit Brussel since 2012. As a research group TOR studies the organization of time. Over the years, a fruitful relationship with Statbel has arisen. This is showed in the partnership during the HETUS-oriented data collections of 1999, 2005 and 2013. From 01/09/2021 – 31/08/2022 an new HETUS-oriented data collection will take place in Belgium with MOTUS as the data collection platform combining different components in a modular way. The modularity defines the most powerful character of the platform.

### The SOURCE™-project

The project defined 4 working packages: Software Outreach, Redefinition of flows and Collect E-data. Each package had the function to introduce MOTUS step-by-step; to the consortia members, but also to other experts throughout the project. The latter was done towards the end of the project via a pilot data collection that gathered comments from 28 different NSIs both inside and outside of Europe. These comments will be used to bring MOTUS to a higher level, which will be achieved when MOTUS would be (accepted as) a shareable platform on the ESS-level.

### The MOTUS platform

MOTUS combines a back-office and a front-office. The back-office supports the researcher to design a research and to collect and disseminate data. The front-office is available to the respondents to take part in the studies.

The use of builders comprised in the back-office supports MOTUS in its most powerful asset: modularity. It is the composition of the builders, and the choices being made within these builders that define the actual set up of a particular research. As such, MOTUS makes it possible to define multiple researches, than can run at the same time, even for the same respondent.

With MOTUS, a continuous development trajectory is foreseen, to grow stronger but also to include new data collection techniques and to make the transition to Smart Surveys. From the beginning of MOTUS, privacy and security was a primary goal. To keep respondents in the center of the data collection is one of the fundaments to arrive to Trusted Smart Surveys.

### Share insights

MOTUS is a software platform performing activities in 3 different core phases of the GSBPM: the build, collect and process phase. These phases have all sub phases of which MOTUS replies to a great deal of them. Through the CSPA-documentation, the NSIs and other interested parties are now informed about the possibilities of MOTUS, and what the inputs and outputs are.

MOTUS foresees/can foresee in all essential hard and software components. There are three API's that arrange the entrance to the components.

The CSPA and the architecture of MOTUS are important elements in setting up a data collection strategy. With MOTUS, a particular strategy is developed where the different MOTUS builders prepare research components, and where these components are used as 'lego' blocks to define a research flow. This research flow defines the different steps a respondent is asked to take in order to successfully participate to a study.

**Share knowledge**

First a prototype diary for the TUS was defined using the MOTUS back-office. As a basis the HETUS-guidelines were taken. To show the power of the MOTUS back-office country specific variations were introduced. Variations are within the questionnaires and the online activity list but also in the definition of the time diary periods. For Belgium this was one weekday and one weekend day, for Germany one weekday and the entire weekend. Within this project also the communication towards the respondents was defined.

Next, this prototype was used during presentations and bilateral meetings with experts. The goal was to collect information about both the front and back-office of MOTUS, but as well to evaluate MOTUS as a software platform. Based on the input of 18 in-depth consultations with national and international experts, a SWOT-analysis was defined showing the Strengths, the Weaknesses, the Opportunities and the Threats of MOTUS to become an ESS-platform.

With all the knowledge in hand, a test environment was setup for all TF and WG members TUS and HBS. In total 157 NSI employees were invited to evaluate the test applications of MOTUS. Test respondents were guided through the different steps of the TUS-survey with a household questionnaire, an individual questionnaire, a one day time diary and an end of diary day questionnaire. After the test the respondents were asked to complete the evaluation questionnaire.

The evaluation questionnaire asked the test persons to give comments and ratings on 4 different domains: the content, the design, the functional qualities and the non-functional qualities of MOTUS. At the end MOTUS was rated towards the question 'whether or not it could grow out to an European or international platform to collect official data'.

65 evaluation questionnaires were completed. In total respondents from 28 different NSIs took part in the test. The output of the questionnaire showed that content, design and technicality go hand in hand. Overall a 4,18 on 5 was given by all respondents completing the MOTUS test application. Nevertheless some essential remarks were made, such as that the HETUS-guidelines need to be evaluated, and especially the Activity Classification List.

On average MOTUS scored a 4,02 on 5 as a platform. However, when respondents are hesitant it is mostly related to the aspects of ownership, architecture, development, license and privacy. This is completely in line with the SWOT-analysis.

Looking to the inclusion of IoT and external sources, the test respondents were more in doubt, but at the same time there is a high average rating of 4,15 on 5 when respondents receive a central position in the control of their own data, which means that Privacy, Security and Going Smart go hand in hand.

**Share ideas**

The correlation between ideas and innovation is high. Without sharing ideas, without organizing debates and reflection there would not be a fertile sole for innovation.

A first innovative take-up was to evaluate the current qualities of MOTUS in the light of organizing a HBS data collection. More concrete the underlying questions were 'Which are the components that are already available in MOTUS that can be reused for HBS?' and 'Which are the components that need to be developed to be able to organize HBS via MOTUS in the future?'.

To start this work a detailed review has been made of the different MOTUS-builders. This review resulted in the finding that MOTUS already has an important amount of elements included that are essential to collect HBS data. One of these elements is the availability over the builders to define a questionnaire, to define communication, to define diary parameters, to define extra languages, to define an invitation strategy, to define a dashboard for fieldwork follow-up and to download the datasets.

Another element is that also the task-to-task functionality that was evaluated positively by the test respondents is an absolute necessity within the ecosystem of HBS. HBS respondents also get questionnaires on the household and individual level and have to complete a consumption diary over a longer period, be it 15 days, a month or even longer. This task functionality gives NSIs the opportunity to organize a data collection without the use of an interviewer, or to reduce these costly interventions (both in time and budget).

A third and last element is that TUS and HBS can be organized via one and the same (web and mobile) application.

Nevertheless there is also a 22-point strong to do-list, which need to be translated into a development story. This list contains the creation of an HBS database structure, the creation of specific HBS diary functionalities, the design of a COICOP-classification structure and the adaptation of a dashboard system that fits HBS purposes.

**Share the MOTUS platform**

The WG/TF have discussed the criteria to which a tool and platform should comply to. These domains are: Functionality & maintainability, Reusability, Online availability ,Usability, user friendliness & accessibility, Data comparability, Statistical aspects and Costs.

Not despite all points are essential, it is in particular the first criteria that holds the basic ingredients for MOTUS to become a shareable tool. The most important question is how to govern the MOTUS-code, so that the outcome of the code is available to the NSIs while at the same time comparability in the data collecting is guaranteed. In doing so this report looked into 4 different architectures to implement MOTUS. These 4 architectures are: MOTUS as a service, data collector, containered and as a native installation.

Based on 22 criteria it became that the installation of as a container is the most promising to arrive to a true ESS-platform that gives high values to shareability and comparability.

With Docker, the MOTUS-application and its dependencies are turned into a package, or a so called Docker-image. This process is also called 'virtualization of software'. A virtual container can run on any Linux server, which is located at the host datacenter.

Multiple docker images can be developed, in numbers but also in content. On the one hand it means that a docker image is available to multiple NSIs with the same possibilities, while on the other hand variation(s) can be supported through Microservices (or Plugins) which can also be dockerized. It is also possible to develop different containers for individual components of an application. An example is the database. The different containers then can communicate with each other via the

network. An extra advantage is that developers from different organizations can share their applications, or components, to arrive to a joint application. This supports collaboration between different organizations, while respecting the specific needs of (e.g.) the Members States' specific environment.

The work on the governance of MOTUS finishes with ideas on the user governance, and more in detail about the aspect of 'Multi-client capability' and 'Role management'. It is clear that developing a software platform is more far reaching than only having a good User Interface. Also the daily actions and roles within a NSI should be covered. Only then a platform can be stretched out over different phases of the GSBPM architecture.

**Recommendations**

After testing the powerful MOTUS platform, Statbel and Destatis are, from an NSI point of view, of the opinion that based on the long existing strategy of the application and its shown merits like flexibility, adaptability and the most important one: modularity, the platform and the academic researchers behind the platform are well-suited to conduct diary-based surveys on a national and international level.

**Keywords**

Data collection, platform, smart statistics, mobile, app, modular