TWINNING CONTRACT

CRIS 2015/370-467

Support to the Israeli Central Bureau of Statistics in Improving the Quality of Official Statistics

MISSION REPORT

on

Component D
Methodological and geo-spatial tools for improving the quality and efficiency of field surveys

Activity D.6
Component D
Design specifications of a geo-spatial application to allocate interviewers' workload in multi-field surveys and to manage and monitor field surveys

Implemented by

Mr. Michael Specht, Chief Adviser, The Management Office, Statistics Denmark.

Mr. Jesper Blaabjerg Holm, Head of Section, The Management Office, Statistics Denmark.

Jerusalem

10-13 September2017

Version: Final version

Authors' names, addresses, e-mails

Mr. Michael Specht
Chief Adviser
The Management Office
Statistics Denmark
msp@dst.dk

Mr. Jesper Blaabjerg Holm
Head of Section
The Management Office
Statistics Denmark
jbl@dst.dk

Table of contents

Annexes produced for the mission (external to the report):

List of Abbreviations

BC	Beneficiary Country
DST	Statistics Denmark
CSO	Central Statistical Office – Statistics Poland
CAPI	Computer-assisted personal interviewing
CATI	Computer-Assisted Telephone Interviewing
CAWI	Computer-Assisted Web Interviewing
CAII	Computer-Assisted Internet Interviewing
CAxI	Common name for all above methods of data collection
PAPI	Paper-Assisted Personal Interviewing
EU	European Union
GIS	Geographic Information System
ICBS	Israeli Central Bureau of Statistics
IT	Information Technologies
MS	Member State (of the EU)
MSS	Multi Survey System
ToR	Terms of Reference

Executive Summary

The main purpose of the activity was to outline design specification and a roadmap for an integrated management system for multi-field workload allocation and monitoring survey status in real time in designated areas. A revised version of the work plan that was drafted during the activity will be presented to the management of the Israeli Central Bureau of Statistics (ICBS) by the end of October 2017 in order to apply for allocation of resources to the project for a 5-year period starting from 2018.

The activity included presentations and discussions of storyboards for a Multi Survey System (MSS), the development of a roadmap and functionality of the MSS as well as tools and best practices for planning, estimating and developing sophisticated IT-systems and project management, specifically:

- Current situation and progress
- The story of Karmiel
- Introduction to the MSS
- Storyboards for actors/user for the MSS
- Portfolio- and project management in Statistics Denmark
- Processes and tools for developing IT-projects.
- Framework for a 5-year plan for designing and developing a multi survey system
- Draft for MSS version 1.0
- A tool and process for prioritizing and cost estimating design, development and implementation
- Use cases for product specification and coast estimation
- Presentation of the ICBS management system developed for the population census

The assessment of the MS experts is that the MSS envisioned by the ICBS has a viable business case and that a full implementation of the system will not only create a significant cost reduction for the ICBS but will also increase the quality of the surveys and support the digitization agenda of the ICBS.

Presentations given by MS experts stressed the need to create a detailed roadmap with resource estimates and to create a project management organisation for the project. Furthermore, the MS experts recommended that the development of the MSS use a stepwise approach for implementation with each step implementing more functionalities into the MSS after each iteration. The outcome of each iteration should be an operational version of the MSS that will be put into practical use until the next version is released. Each iteration will give the ICBS significant benefits such as; cost reduction and quality improvement. The BC and MS experts outlined a roadmap with four iterations. The first iteration will integrate the Social Survey (SS) and the longitudinal survey (LS) since the ICBS has been managing these two surveys in parallel since 2017 with supervisors and interviewers being trained and performing both surveys but with no integrated tools supporting their work. The first iteration will focus on the development of functionalities for the interviewer and the supervisor. The MS experts recommended creating a project organization for the development and implementation of the MSS with a full-time project manager in order for the project to be successfully completed within the time frame of five years. In addition, dedicated staff are recommended in all areas of planning and development. Due to the multidisciplinary nature of the project, the following area of expertise is regarded as essential: Project Manager, IT-Developer, IT-Designer, QA, Survey Specialists, and Methodologist.

1 General comments

This mission report was prepared as part of the Twinning Project *"Support to the Israeli Central Bureau of Statistics (ICBS) in Enhancing the Quality of Official Statistics".* This was the sixth activity within Component *D: Methodological and geo-spatial tools for improving the quality and efficiency of field surveys*.

The main activities of the mission were:

- Presentation of the current situation and progress in the ICBS regarding the planning of field surveys, sampling, and the allocation of workload to interviewers and the ICBS's vision of a multi survey system for field surveys.

- Presentation of portfolio and project management in Statistics Denmark – the project management triangle (cost, time, scope and quality), organization, processes, follow up etc. and presentation of processes and tools for developing IT-projects in Statistics Denmark.

- Presentation and discussion of story boards for a multi survey system for field surveys.

- Discussion and drafting a 5 year plan for designing, developing a multi survey system as well as discussing and drafting a first version of the MSS.
- Presentation of a use case diagram including examples of brief use cases in relation to the MSS as case.

The mission assisted the ICBS and the MS experts in getting an overview of the present situation regarding methodology to allocate interviewers' workload in field surveys in Israel and the vision for a future multi survey system for field surveys in the ICBS.

MS experts presented tools and processes for designing and developing sophisticated IT systems and managing complex projects.

The discussion on the prioritization of functions of a multi survey system resulted in the establishment of a framework and toolbox for the ICBS to create a detailed roadmap for designing and developing a multi survey system. The discussions on functionality for a multi survey system led to an early draft for MSS version 1.0 that will have the basic functionality that will produce cost-reduction and quality improvement when the ICBS are conducting surveys.

The experts would like to express their thanks to all officials and individuals met for their kind support and for the valuable information they provided, which highly facilitated the experts' work.

The views and observations stated in this report are those of the consultants and do not necessarily represent the views of EU, ICBS or Statistics Denmark.

2 Assessment and results

All the foreseen activities were carried out following the plans in the ToR; cf. Terms of Reference (Annex D6 - 1). Outcomes were favourable, and results and conclusions are described in the following section.

ICBS presented:

- Introduction to component D and Introduction to Survey Department (Annex D6 – 4)
- The story of Karmiel (Annex D6 - 5)
- Introduction to the MSS (Annex D6 - 6)
- Story board for Interviewer (Annex D6 - 7)
- Story board for field supervisor (Annex D6 - 8)
- Story board for field district manager (Annex D6 - 9)
- Story board for headquarters coordinator (Annex D6 – 10)

The MS experts presented:

- Portfolio- and project management in Statistics Denmark – the project management triangle (cost, time, scope and quality), organization, processes, follow up etc. (Annex D6 - 11)
- Processes and tools for developing IT-projects. (Annex D6 - 12)
- Framework for 5-year plan for designing and developing a multi survey system (Annex D6 - 13)
- Draft for MSS version 1.0 that will have the basic functionality that will produce cost-reduction and quality improvement when ICBS are conducting field surveys (Annex D6 - 14)
- A tool and process for prioritizing and cost estimating; design, development and implementation of a multi survey system and went through an exercise with the ICBS using these tools and processes for a preliminary cost estimation of the first iteration of the system. (Annex D6 - 15)
- Example use case for product specification - Edit interviewer (Annex D6 – 16)
- Example use case diagram for product specification (Annex D6 – 17)

2.1 Current situation at ICBS assessed

The ICBS had prepared comprehensive presentations giving the experts an excellent overview of the current situation of field surveys at the ICBS including characteristics and constraints for individual reoccurring surveys.

2.1.1 Organization and responsibility

The main function of the Survey Department at the ICBS is to plan, monitor and perform surveys. Surveys include field surveys (CAPI), telephone interviews (CATI) as well as web based-surveys (CAWI/CAII).

In figure 1 the organizational structure of the Survey Department at the ICBS is outlined. For field surveys, the most important units are the Central Survey Headquarters, three data collection centres, two regional centres and 35 domains.

The Central Survey Headquarter is located at the ICBS's main office in Jerusalem and the three data collection centres are in Haifa, Tel Aviv and Jerusalem respectively. Each data collection centre is managed by a district manager and in Tel Aviv the district managers are assisted by two regional managers due to the district's large size.

The Jerusalem district is organized slightly differently because the data collection centre is a part of the CATI centre and thus has three managers.

Each data collection centre manages several domains i.e. an enumeration area for which a supervisor is responsible. At present, the total number of domains is 35. Each domain has one full time supervisor who manages the domain and interviewers associated with the specific domain. Each domain/supervisor is responsible for only one survey (except in Jerusalem where each domain is responsible for multiple surveys). Each domain supervisor is responsible for 8-12 field interviewers (adding up to nearly 300 field interviewers in total). The domain supervisors as well as the regional managers operate from the data collection centres. The geographical area covered by each supervisor/domain differs between each survey.

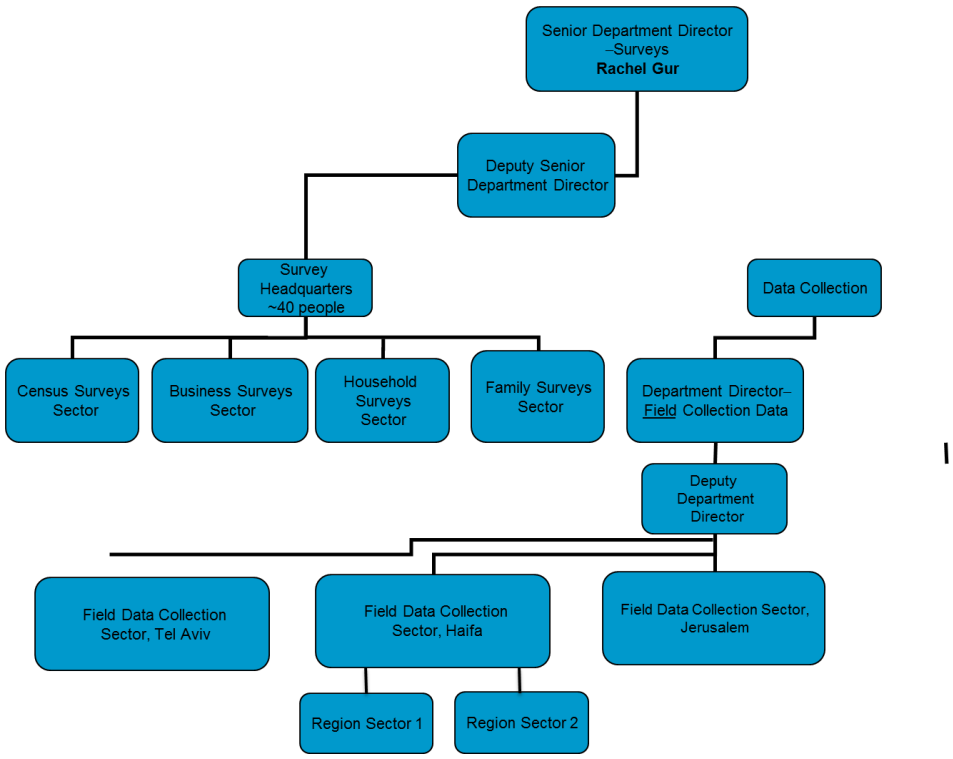

Figure 1: *Diagram of the organizational structure for field surveys at the Survey Department at ICBS*

In 2017, the ICBS carried out a pilot on integrating the management and interviews of the Social Survey (SS) and the Longitudinal Survey (LS) in all districts in order to get feedback from supervisors and interviewers on the multi survey approach. The integration was done with the current tools. The main complaint from supervisors and interviewers was that they needed to use multiple tools to perform their operations and thus, the need for an integrated tool supporting their work is high.

2.1.2 The story of Karmiel

The current situation of field surveys in Israel creates some inexpedient situations. The ICBS presented the case of the city of Kamiel where on the same day three interviewer's travel to Kamiel from three different locations to do three different surveys. All in all, 232 km were travelled for a total travel time of 4.5 hours which costs the ICBS 505 NIS. If the three surveys would have been combined, the theoretical expense for travel cost would have been 180 NIS for one interviewer traveling to Karmiel and conducting three interviews. The MS experts agree with the IBCS that the case highlights the potential cost saving for ICBS by moving to a geo-aware multi survey system.

2.1.3 Multi Survey System

The ICBS presented their vision and goals for a multi survey system named MSS that will allow multi collection methods (CAWI, CATI, and CAPI). The vision is that the MSS will combine the needs for all stages of all surveys into one management and monitoring system that will provide a platform for all field collection methods and that the platform will operate online in real time. It is the assessment of the MS experts that the system envisioned by the ICBS will not only allow for a significant cost reduction for field surveys but will also modernize the survey method and improve quality.

2.1.4 Mission Achievements

The most significant achievements of the mission are related to further clarifying the functionality and design specifications, with special focus on version 1.0 (Figure 2 and Annex D4 -14). The approach taken was, based on the storyboards, that the functionalities for the fully implemented MSS version 1.0 was identified. Furthermore, tools and processes for prioritizing and cost estimating as well as the use of case diagrams and use cases for product specification used in Denmark, were presented during the hands-on exercises (Annexes D6 – 15 -17).

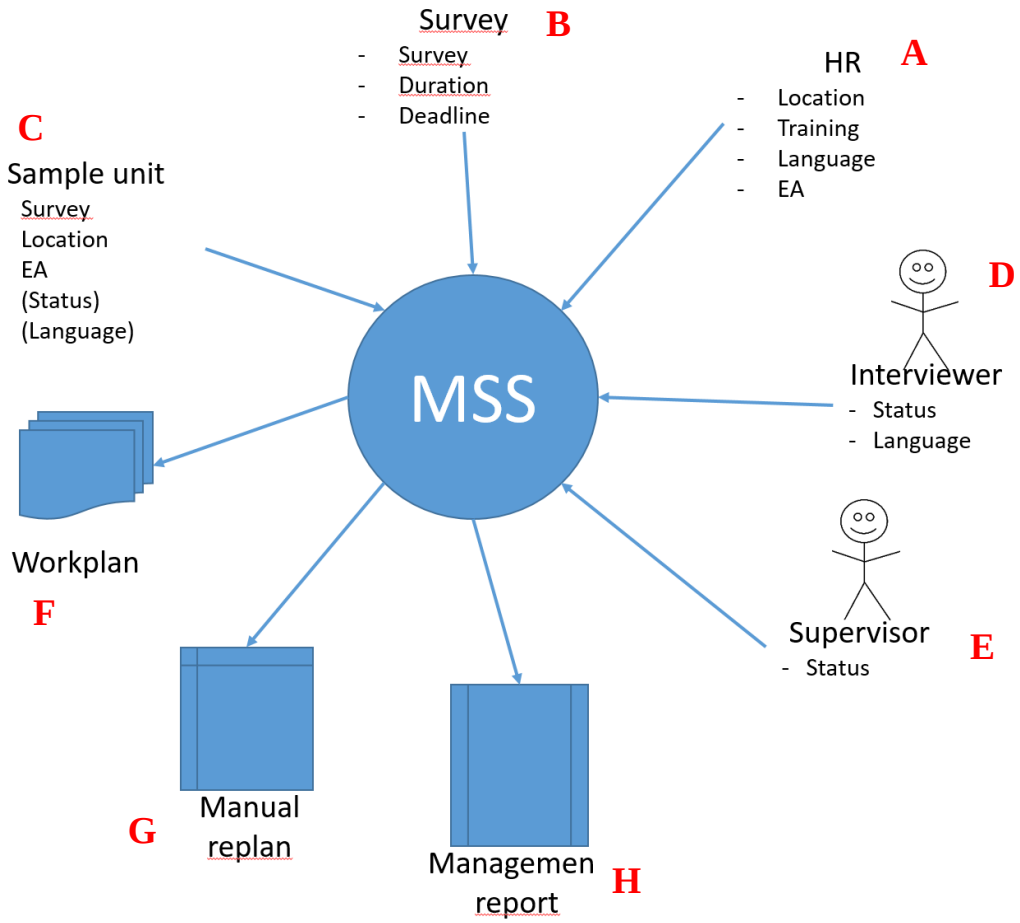

Figure 2: *Outline of an idea for a version 1.0 of the MSS that will integrate the Social Survey and the Longitudinal Survey as envisioned by the MS experts.*

INFORMATION ENTERING THE MSS SYSTEM:

HR database (A) *- information entered to the database by the ICBS Headquarter. Updated by supervisors*

- Location - Home address of interviewer
- Training - Which surveys each interviewer has been trained for
- Language – Language skills of the interviewer (Hebrew, Arabic and Russian)
- EA - Enumeration area(s) that the interviewer can operate in

Survey database (B) *- information entered to the database by the ICBS Headquarter*

- Survey – Basic information like - name of survey, size of survey (no. of respondents), collection mode(s), Instructions for the questionnaire, the digitalized questionnaire, name of the ICBS coordinator
- Duration – Length of the survey period
- Deadline - End date of the survey

Sample unit database (C) *– information entered to the database by the ICBS Headquarter and tatus updated by supervisors (and the interviewers)*

- Survey - Surveys assigned to each sample unit
- Location - x, y coordinate for sample units
- EA – Database placing sample unit into enumeration area (and statistical area etc). Visualization on a map should be possible (already produced for the population census by the GIS unit)
- (Status) – Status provided at any given time for the sample unit e.g. invitation letter mailed out, assigned to interviewer, interview completed, appointment set with the respondent, manual re-planning due to non-response (refusal, not found, out of residence, temporary unavailable, permanently unavailable, language difficulties), appointment set
- (Language) – Language(s) of the sample unit (possible to enter information based on the population census)

Interviewer (D) *- information entered to the database by the interviewer*

- Working days – Days the interviewer is available for work (visualized on a calendar)
- Status – Status of completed and assigned interviews at any given time as a function of the survey
- Language - Language the interview has been completed in

Supervisor (E) *- information entered to the database by the supervisor*

- Contact – Contact information
- Status – Days the supervisor is working and alternatives contact information during vacation (visualized on a calendar)

INFORMATION EXTRACTED FRON THE MSS SYSTEM:

Workplan (F) *- Automated work plan (monthly, weekly and daily) for the interviewer based on a decision hierarchy that includes e.g. training of the interviewer, language skills of the interviewer, language requirement of the sample unit (or dominant language in the EA), time frame, deadline and status of survey, (travel distance). NB - not hieratically ordered here.*

Manual re-planning (G) - Manual re-planning due to non-response

Management report (H) Status of completed and assigned interviews at any given time as a function of survey, Interviewer, EA, in version 1.0 only as tables in later versions also on maps, graphs etc.

At the mission a short-term and long-term roadmap for the ICBS to achieve their vision of a multi survey system was outlined and discussed (for draft please refer to Annex D6 – 13). The MS experts presented and gave hands-on exercises to the ICBS. Furthermore, important connections between the MS experts and the ICBS employees have been created and plans for further information exchange and best practices are expected.

3 Conclusions and Recommendations

The ICBS team has already described their vision for a multi survey system in detail and proved that there is an extremely positive business case for such a system. The participating staff is highly knowledgeable of the subject and of the issues at stake and are very motivated in progressing with the planning, development and implementation of the system. Furthermore, it is very beneficial that the group working with the MSS has highly skilled participants from the IT, Methodology, Survey and GIS departments and that these staff work together flawlessly.

To move forward, the ICBS must further work on detailing and cost estimating the functionality of the MSS and by doing that increase the detail of the roadmap.

The experts recommend that the ICBS implement the preliminary roadmap developed during the mission taking into consideration the recommendations given below.

Recommendations:

- Finalise details of the design specification and the roadmap outlined at the current mission, including deadlines and cost estimates by 30 October 2017.
- Present a roadmap to the top management for approval and funding. Included with the roadmap it is recommended to present two scenarios; one where the ICBS does not invest in a MSS and one where the investment is made. The scenarios are to focus on the investments needed and the benefits gained from implementing the MSS. It is especially important that a good estimate is made on the potential cost reduction of the MSS as well as the development cost for the system both as a total but also distributed between different departments in ICBS.
- Create a project organization for the development and implementation of the MSS with a full-time project manager as soon as the development of the system is funded.
- Include the end users of the MSS in the detailing of the specification and test of the system functionality.
- Develop the MSS in four iterations over a period of five years with 1.5 years for the first iteration.
- Use 3-point estimation for estimating the resources needed for individual functions in order to achieve a qualified cost estimate for the development iterations.
- Develop a first iteration of the MSS with limited functionality for only the Social and Longitudinal Surveys that will give the ICBS significant cost reduction and quality improvement and is prepared to be expanded with additional functionalities and surveys.
- Allow rigorous testing of each iteration of the system in the roadmap.
- Test all iterations of the system in production situations in order to gather real world experience with the system for continued development and improvement of the system.
- Develop the first iteration of the system with functionality like that shown in Figure 2.
- Reuse the code from the census system in the MSS as much as possible in order to reduce development cost.

- Commit a team of fulltime it-developers to the project. It is the conviction of the MS experts that fulltime it-developers together with dedicated it-designers, survey specialists, methodologists, QA etc. are essential for the development and implementation of the MSS within the 5-year timeframe.
- Implement a development process like the one shown in figure 3.

Figure 3: *Development process*

- If needed additional MS expertise to this component could be introduced for the development phase (use cases etc.) that is to be developed over the coming months. The MS experts see this phase as extremely crucial.