



MONITORING AND EVALUATION FRAMEWORK

for WASH Market-Based Humanitarian Programming

USER GUIDELINES FOR ICT IMPLEMENTATION



OXFAM

MONITORING AND EVALUATION FRAMEWORK FOR WASH MARKET-BASED HUMANITARIAN PROGRAMMING

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September 2017

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FUNDING

This report was made possible by the generous support of the American people through funding received from the United States Agency for International Development (USAid) under a grant from the Office of U.S. Foreign Disaster Assistance (OFDA). The report is an output from a global program entitled 'Promoting Market-based Responses to Emergencies through WASH Market Mapping and Analysis' (OFDA Grant AID-OFDA-A-15-00038) managed by Oxfam's Global Humanitarian Team. The contents are the responsibility of Oxfam and do not necessarily reflect the views of USAid or the United States Government.

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1 INTRODUCTION

Engagement with market actors is increasingly being recognised to be a key part of humanitarian programming as these actors are well positioned to provide services and distribute commodities to affected communities. At the same time, cash transfers are becoming more widely utilised to enable these same communities to access markets of goods and services that they urgently need during and after an emergency. To enable programmes to monitor their market based WASH programmes better a generic Monitoring & Evaluation (M&E) framework has been developed (see www.emma-toolkit.org/sites/default/files/bundle/Oxfam%20Generic%20Framework%20PROOF-4.pdf).

This document is part of a set of documents related to a “Generic Monitoring and Evaluation Framework for WASH market-based Humanitarian Programming”. This document explains how to use and adapt the current ICT tools developed as an example of a possible implementation of the WASH MBP framework. The proposed ICT tools are deemed useful for the implementation of the framework, but this is not a specific endorsement of these tools. Alternative tools existing as described in the report. Alternatively, the framework can be implemented by pen and paper, without the use of any ICT tools.

Neither the Generic M&E framework nor its ICT implementation are final products. They can be improved over time with the experience and hope that you will share your experiences¹ and make suggestions for improvement² so other staff/professionals can benefit from your knowledge.

This implementation uses two proprietary programmes which are widely available.

- 1 *SurveyCTO* provides the same functionality for their free and paid accounts. To keep your free account open, one has to use the account at least once per month. Once you are convinced of its usefulness it is worth purchasing a licence as this enables extra functionalities, and allows the developers to further develop their software.
- 2 *Power BI* is freeware from Microsoft. It is software with many possibilities. We aim to use the more basic function so it should be relatively simple to add and change analysis in the dashboards designed for this MBP WASH M&E framework.

This document is not a training document. Both *SurveyCTO* and *Power BI* have far too much functionalities to do it justice in the following pages. They have both training material worth looking at if you want to gain a better understanding. What you will learn will be very transferable as a skill and certainly worth your effort.

- For *SurveyCTO* you can start here: www.SurveyCTO.com/support/video-library.html
- For *Power BI* you can start with the guided learning guide: <https://PowerBI.microsoft.com/en-us/documentation/PowerBI-service-get-started>



These Guidelines explain how to use and modify existing data collection forms (*SurveyCTO*) and reports (*Power BI*).

It is not an introduction to either *Power BI* or *SurveyCTO*

1.1 WHY READ THIS DOCUMENT?

The generic M&E framework has the objective to be applicable to as many situations as possible. While it can be directly applied, it is expected to benefit from adaptation to the local context. The ICT application of the general M&E framework follows the same approach, and it can be used to apply the generic M&E framework directly. To do that there is an extensive use of skip logic which needs to be understood before making any changes to the questionnaires in *SurveyCTO*. The data generated out of this questionnaire can link directly to the *Power BI* dashboards developed for this framework. Once changes are made in the *SurveyCTO* questionnaire, *Power BI* modifications are also required to accommodate these changes. The way both *SurveyCTO* and *Power BI* implement the general M&E framework is explained at length below. So if you are considering making changes it is recommended that you study this document first.

¹ You can share your experience via MIC D-Group: <https://dgroups.org/dfid/mic>

² Please send your suggestions to Laura Eldon, e-mail: LEldon@oxfam.org.uk

‘Straight out of the box’ is probably the way you will be using this implementation and that is fine. It will help you have a coherent set of indicators and analysis. The analysis is build up in such a way that the first tab will give the general overview with further tabs going into more detail.

A last point is that this a first iteration of the WASH MBP M&E framework as well as its implementation. If you have any suggestion to improve it please contact Laura Eldon or Louise Mooney (see Cacts above) to propose modification to the generic framework and its implementation in order to improve a next iteration. We look forward hearing from you.

DOCUMENT STRUCTURE

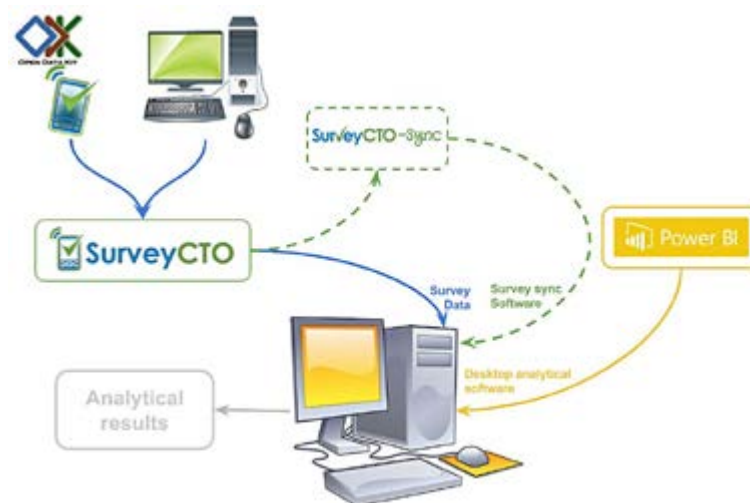
At the beginning, we will briefly introduce tools used for Generic Framework Implementation. In following section how to use tools without any modifications is presented (see section: “Straight out of the box” implementation). We focus on how to use questionnaires in *SurveyCTO* and how to look at the analysis in *Power BI*. Then we explain how to modify tools for specific needs of your project (see section: “How to adjust tools for”). At the end, we also give some references to alternative ICT tools with similar functionalities.

1.2 ICT IMPLEMENTATION OF THE M&E FRAMEWORK

The generic M&E framework has been implemented using *SurveyCTO* for the data collection using some coherence testing and uses *Power BI* for the analysis and reporting.

SurveyCTO is a web based survey tool which requires internet access to design and modify the questionnaire. Collection can be done off-line with Android based Open Data Kit (ODK) which has been modified to work with *SurveyCTO*. Please note that a standard installation of ODK will not work with *SurveyCTO*! Any device that allows entering data into a website can also supply data online when this function is enabled in *SurveyCTO*.

Figure 1: Software setup of *SurveyCTO* (&Sync) and *Power BI*



Power BI needs to be installed locally on a computer with a Windows operating system. Alternative installations are discussed later in this document. The data used in *Power BI* will install on any computer running *Power BI*. There are alternatives but these fall outside the scope of this document.

1.2.1 SURVEYCTO

Is well developed data collector with many possibilities. It allows for the collection of web-based data collection which will work on most digital devices with a web-browser and an online connection.

INSTALLATION

In our use of the software there were three different parts which all have a different way of installation (web interface, ODK and *SurveyCTO*-sync)

MAIN SOFTWARE

There are different parts to survey-CTO. The central part in which questionnaires are deployed and data is received is online as a “Software as a Service” (SaaS) offering. So no installation is required and there no domain restrictions as in the online version of *Power BI*.

DATA SYNCHRONISATION APP

Survey CTO has an application that synchronise the data on-line with the data stored locally. This app is a cross OS platform but needs to be installed locally. This app is not required to download the data as illustrated in Figure 1, but is very convenient for updating multiple data set simultaneously.

PHONE BASED DATA COLLECTION

Any phone with web browser can use the web based survey if this is enabled. An alternative that allows collecting data offline is only available for Android based phones. *SurveyCTO*'s uses an adapted version of ODK which allows mobile phones running under Android to collect data offline once the forms are already downloaded on the phone. To download forms or upload data the phone will need to be connected to the internet and have access to the questionnaires that you want to deploy. There are some alternative installations documented for situations where internet is not available but these fall outside the scope of this document.

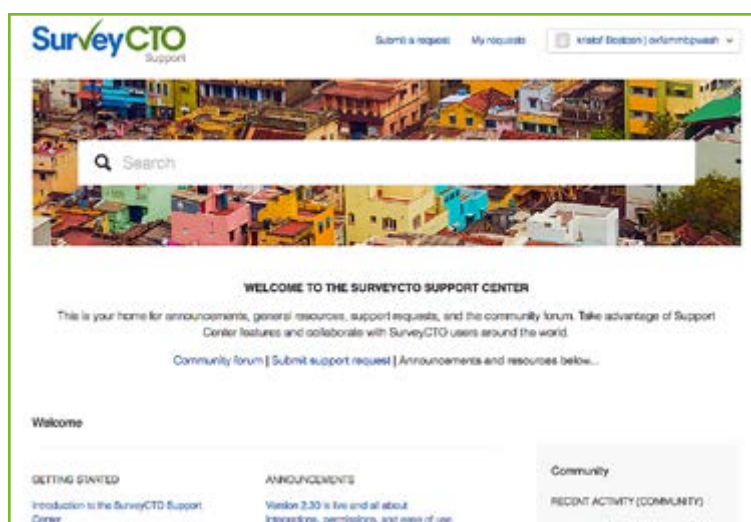
EXTRACTING DATA

There are two ways to download the survey data from *SurveyCTO*. Either directly from the web-interface or using *SurveyCTO-sync*, a piece of software to be installed on the computer which also has *Power BI* installed. The latter makes it easy to download multiple dataset simultaneously.

LEARNING SURVEYCTO

SurveyCTO is very intuitive particularly if you have used survey software before. It has a ‘Help’ function integrated into each *SurveyCTO* server (where your survey and data are stored online). It is comprehensive and should answer most questions you might have. There is also a support centre for which you need to have registered as a user. Individual registration is free of charge.

Figure 2: *SurveyCTO* support centre



1.2.2 POWER BI

The overall aim of the framework is to learn from the collected data and its analysis to support decisions about how to engage most effectively with markets in humanitarian programming. Because analysis is so central, analysis in *Power BI* will be covered first. This is to ensure that the data provided by *SurveyCTO* comes in a format that can be analysed by *Power BI* as it is currently configured.

INSTALLATION

There are two version of *Power BI*, a “Desktop version” and a web-based version. To get full access to the report creation and modification tools in *Power BI* you will need to install the “desktop” version of *Power BI*. For this you will need a computer with a recent version of Windows-OS installed. There are currently no native versions for *Power BI* for Linux or Mac OS. Such versions have been considered for some years but there are currently no known plans to actually develop these.

There is a tested way of running *Power BI* on a Mac using a virtual machine like Parallels (parallels.com). But Parallels requires a paid licence. A free alternative is Brew as homebrew (brew.sh) for Mac OS and LinuxBrew (linuxbrew.sh) for Linux. Some computer literacy is required to use Brew. At the time of writing we did not find any conclusive information on the use of Brew with *Power BI*. *Power BI* has also a web version which can be used by any internet browser. It allows some limited queries but does not allow editing the dashboard themselves.



There is much more functionality in the desktop version of *Power BI* than there is in the web version. However there are some functionalities that exist only in the web version which means that both the desktop and web versions are required to analyse and disseminate results.

LEARNING POWER BI

These guidelines do not deal with the basic use of- and/or functions in *Power BI*, because the software already has an excellent online learning centre and community.

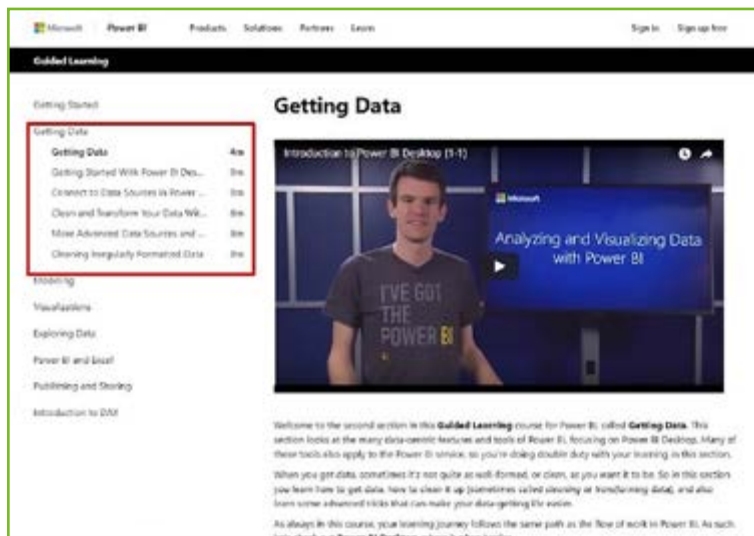
The on-Line learning centre can be reached by following this link: <https://PowerBI.microsoft.com/en-us/guided-learning/Power-BI-learning-0-0-what-is-power-bi/>

Figure 3: Topic overview in *Power BI* Online Learning Centre



By clicking on any of topic presented on the left hand side of the screen, a drop down menu opens up with sub-topics. All sub-topics include a video, an explanation and estimated time to complete the subject (see Figure 4).

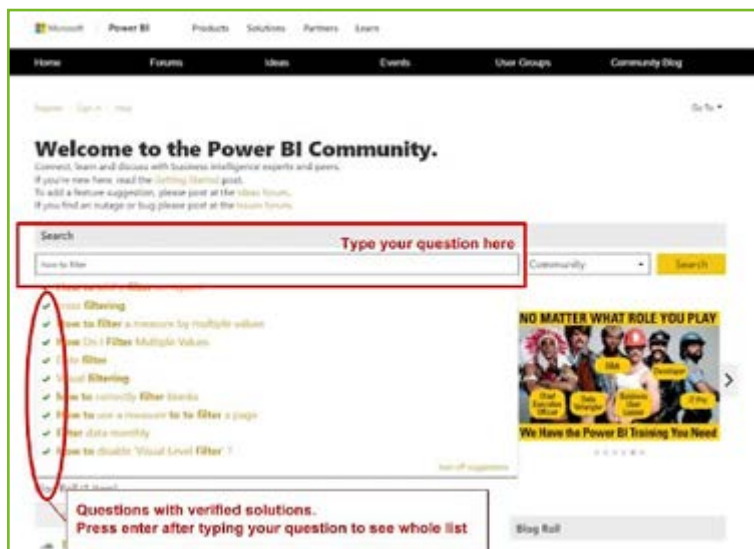
Figure 4: Example of sub-topics in *Power BI* On-Line Learning Centre



The learning-by-doing approach is particularly useful as videos are well paced and designed for user to try the same exercise whilst listening/watching.

For troubleshooting and any questions, it is recommended to reach out for the *Power BI* Community: <http://community.PowerBI.com>. You just need to type your question in "Search" box (as presented in Figure 5). The search uses natural speech syntaxes, so type the whole question as you would ask verbally instead of just the keywords. Check previous answers for solutions that fit your problem. Those suggestions that have been verified are marked with a green check sign at the left hand side (see Figure 5).

Figure 5: Finding answers using *Power BI* Community



Recently a free EDX on-line self-paced course has been available for learning *Power BI* at: www.edx.org/course/analyzing-visualizing-data-power-bi-microsoft-dat207x-7?utm_source=sailthru&utm_medium=email&utm_campaign=newsletter_student_active_20170926

2 “STRAIGHT OUT OF THE BOX” IMPLEMENTATION

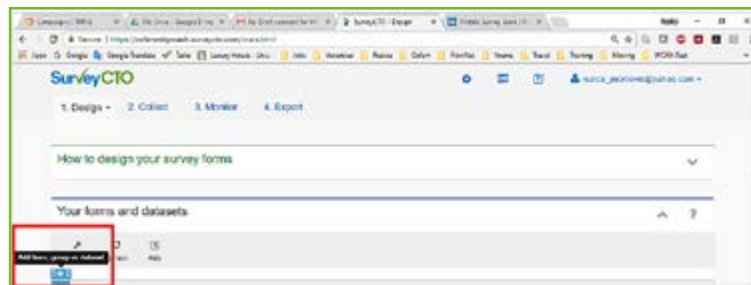
If you would like to implement the framework within your project there are several points of attention. We will firstly explain how to set up questionnaires in *SurveyCTO* and then what the analysis in *Power BI* can show.

2.1 USING QUESTIONNAIRES FOR THE FIRST-TIME IN *SURVEYCTO*

If you have not used *SurveyCTO* before or do not have an account, the easiest way is to open a new account is by following this link: www.SurveyCTO.com/index.html. Once you set up your account you can simply upload questionnaires to the platform. Click here to download Survey CTO files - www.emma-toolkit.org/documents/survey-cto-bank. After saving these files, you can proceed with uploading questionnaires to your account.

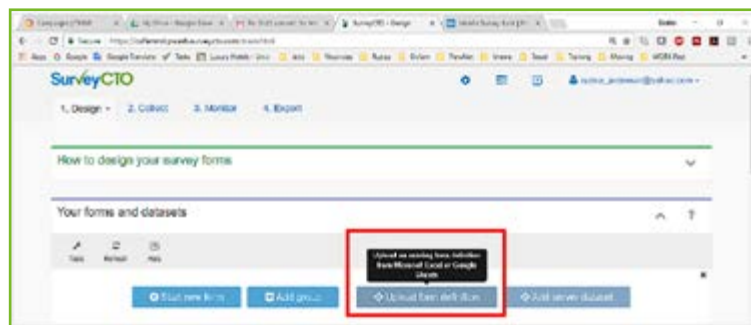
You can add new form by clicking on [+] sign in Design tab (see lower left hand corner in Figure 6 below).

Figure 6: Adding new form in *SurveyCTO* – step 1



Then choose “Upload from definition” which allows you to upload an existing form from Microsoft Excel or Google Sheets.

Figure 7: Adding new form in *SurveyCTO* – step 2



Once you choose this option, additional options appear offering uploading files from different locations.

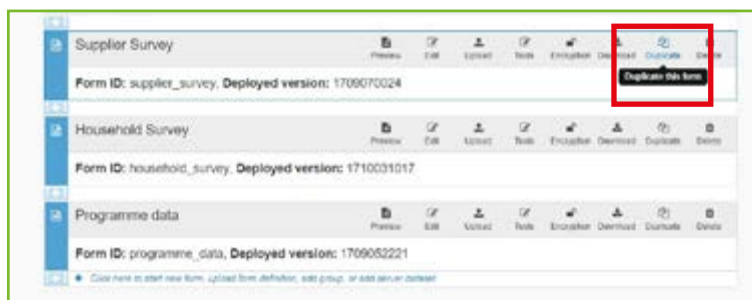
2.2 DUPLICATING QUESTIONNAIRES IN SURVEY CTO FOR RE-USE OR MODIFICATION IN OWN PROGRAMME

As different reporting periods for data collection are already build into the survey with comprehensive skip question logic, it is useful to use the same survey for baseline, mid-line/post distribution monitoring and end-line. In this way, you can get rich longitudinal data which allows you clear overview in analysis template built in *Power BI* for this framework.

However, there might be occasions when you would like to re-use an existing survey for different project. This section briefly explains how to duplicate survey in Survey CTO and how to make changes in the questionnaires.

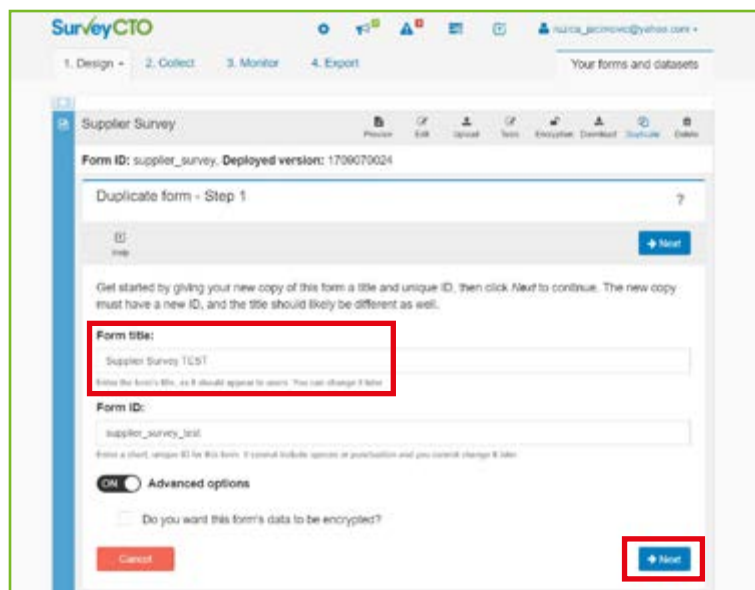
- 1 Open your *SurveyCTO* account or go to: oxfammbpwash.SurveyCTO.com
- 2 Scroll down to survey you would like to modify and choose “Duplicate” from the ribbon:

Figure 8: Duplicating a chosen file



- 3 Once you click on it, a new window appears where you should input a new name for the survey. Make the name so plain and clear possible that anybody will understand that this is your survey. Form ID is then automatically generated. Once you have defined the name, click on next:

Figure 9: adding new name to the copied file



In *SurveyCTO* you use a shared environment which means that all changes you make to a file are changes for everybody else. There two consequences to this are:



- 1 Make a copy of the “master generic files” and avoid making changes to that file
- 2 Choose a name that is clear to people within your project AND outside you project so the files can be clearly identified by anybody not only now but also in the future, as such surveys may be repeated over the years.

- 4 In next window, it is possible to either download the new questionnaire (onto your computer or Google Drive) or to edit it online:

Figure 10: Select where you want to edit the questionnaire

Online editing is probably the most convenient if you have a reliable internet connection. As we assume that the majority of people would opt for it, this is the only choice explained in the rest of this document.

- 5 When “Edit online” is chosen, a new window will appear where one can edit, add or remove questions in the new questionnaire. At first it is best to ‘add’ and ‘hide’ rather than deleting. ‘Hiding’ can be done by conditional showing questions (also referred to as ‘Skip logic’). Create a rule that refers to your implementation of the framework which needs to be asked prior to applying the rule.

Figure 11: Online editing of the selected questionnaire



It is very important not to modify the **Question NAME** (see Figure 12) when editing questions as these are used in *Power BI* as column and variable names in the analysis and reporting! When changed *Power BI* will give an error when they are referred to.

Figure 12: Once the name is referred to in *Power BI* it should not be modified in *SurveyCTO*

The screenshot shows the 'Edit select_one field' interface in SurveyCTO. The 'name' field is highlighted with a red box. The field name is 'QuestionName'. The interface includes a 'Required options' section with 'type' set to 'select_one', 'choice list' set to 'Use an existing choice list', and 'label' set to 'Name of the project for which you provide data'. There are also 'Shortcuts' and 'Labels' sections on the left.

The same goes for the value field in a multiple-choice field (see Figure 13). Changes in the value field are not accepted by *Power BI* and result in an error. This is because, when datasets are exported, multiple-choice options are stored in separate columns named by the name of the option. If an option name is changed, the *Power BI* analysis template will not generate charts and tables automatically so you will need to correct this manually.

Figure 13: Maintain value fields in single or multiple choice questions

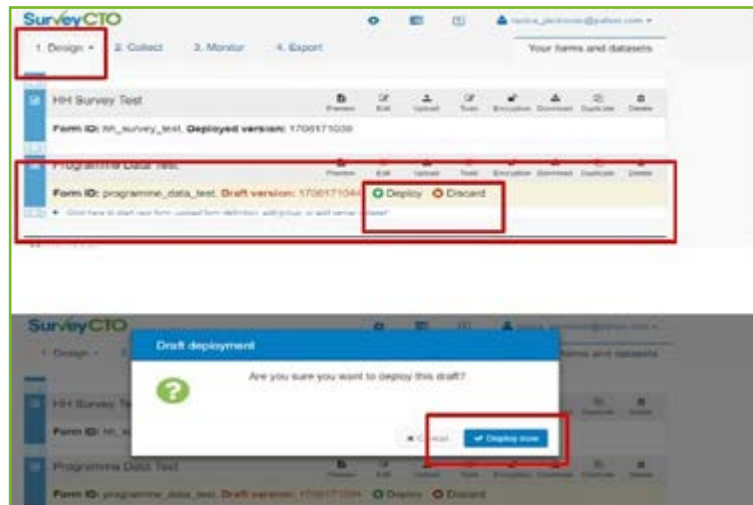
The screenshot shows the 'Edit select_one field' interface in SurveyCTO. The 'choice list' section is highlighted with a red box. The choice list is 'water/sour'. Below it, the 'choices' section is visible, with a choice 'Well (Risk)' highlighted. The 'value' field for this choice is highlighted with a red box. The value is 'well'. The interface includes a 'Required options' section with 'type' set to 'select_one' and 'choice list' set to 'Use an existing choice list'. There are also 'Shortcuts' and 'Labels' sections on the left.



If it is not needed, it is very important NOT to modify “value” field in the choice list when editing a multiple choice list in *SurveyCTO* (as presented in Figure 13 and explained above) because these are used for automated generation of charts and tables in *Power BI* analysis!

After finalising and saving the form, a new survey form will be visible in the “Design” tab. You can still choose to Deploy or discard it. By clicking on “Deploy”, a pop-up window will appear for you to confirm it, after which the form is ready for data entry.

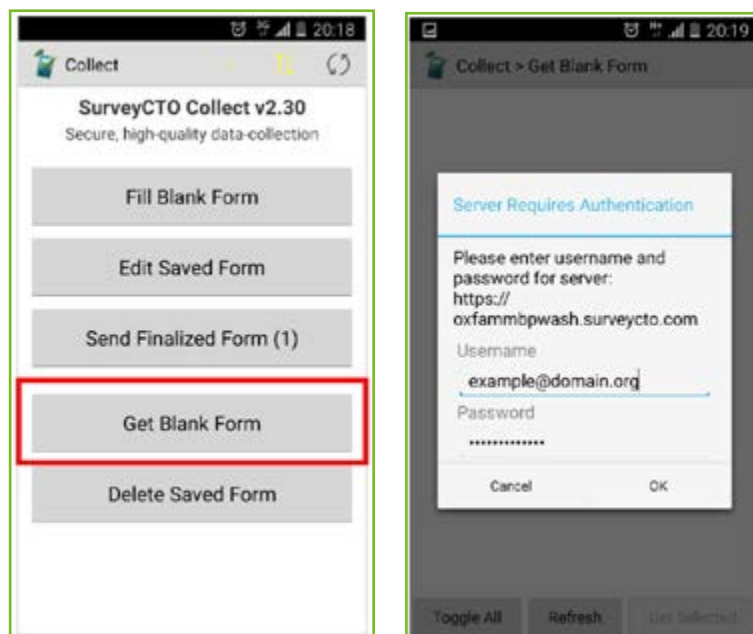
Figure 14: Deploy or Disregard modified questionnaire



2.2.1 DATA COLLECTION USING ANDROID PHONE

Data collection on android phones will only use the new forms once forms are deployed in *SurveyCTO* (as presented in Figure 14 above), but you need first to get them on your phone (see Figure below). As long this is not done, you will be using the old forms even when the new forms are deployed on the server.

After installing and opening the *SurveyCTO* application on your phone, choose "Get blank forms" (on the left in Figure 15), after which you would need to log to your account to be able to obtain forms (on the right in Figure 15).

Figure 15: Getting blank forms using *SurveyCTO* ODK android phone app

2.2.2 EXPORTING DATA FROM SURVEYCTO

Please note that *SurveyCTO* platform offers different ways to export data, out of which only one will be explained below:

Once the data collection is done, you can download datasets from *SurveyCTO* by clicking on “Export” tab and by choosing the survey for which you want to export data.

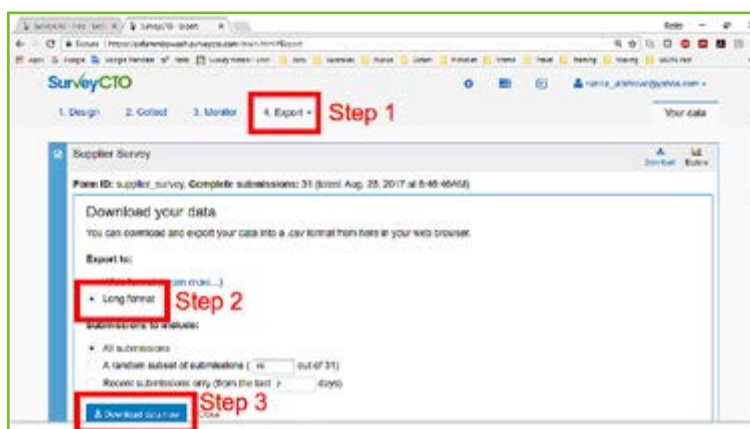
Please select “Long Format” (see Step 2 in Figure 16 below).

This will allow data to be downloaded in separate datasets for any repeating groups of questions in the survey:

- In the case of Supplier Survey, we added a ‘Market Monitoring Form’ as a repeating group of questions.
- In the HH survey, we added a repeating group related to HH use of Cash Transfers.
- In both questionnaires, there is additional repeating group at the end of the questionnaire that can include specific questions that programmes want to include (and are not already part of tools developed for generic indicators). This allows programmes to have their specific data in separate dataset, which can be easily added to *Power BI* for the analysis.

Once you selected this option, click on ‘Download data’ and data is exported in CVS form from *SurveyCTO* platform.

Figure 16: Exporting data from *SurveyCTO*



When extracting data in CVS form, select “Long format”.

2.3 DATA ANALYSIS IN POWER BI

If you are using original questionnaires developed for this framework in *SurveyCTO*, after exporting you can analyse data in *Power BI* using the report templates developed for generic framework. Note that template report in *Power BI* already has data based on which template is developed. Therefore, you will always need to change source of data. This section explains how to do this.

You can use either using *Power BI* desktop or on-line version. Note that *Power BI* desktop has more functionalities than on-line platform. In this section, we focus on the desktop version.

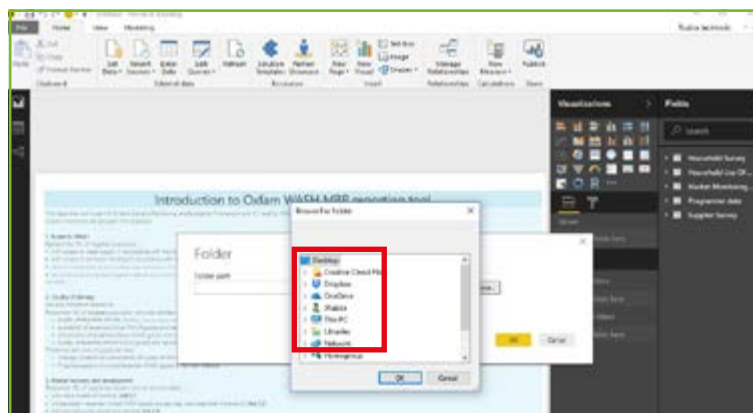
After you import your dataset, the analysis should be generated automatically. This section explains how to import / add your data to *Power BI*, the structure of the report, and showcases some of its useful functionalities. If you want to learn more, we provide useful links in section: *Learning Power BI*.

2.3.1 IMPORTING DATA TO *POWER BI*

First of all, *SurveyCTO* exported data needs to be saved at a specific location. *Power BI* can access data stored at different locations, such as:

- your computer (linking to specific folder or choosing specific files),
- Creative cloud files
- Dropbox
- OneDrive, or
- Your computer Networks
- Figure 17 shows the data location dialog in *Power BI* in case you would like to add a new set of data.

Figure 17: Data sources supported in *Power BI*



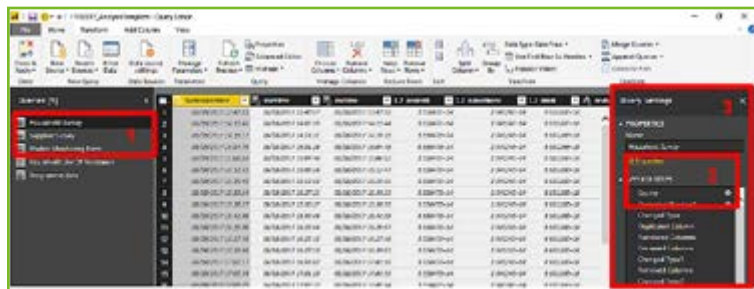
This software does not have a real reporting template which can be linked to new data. This is probably the most significant limitation of *Power BI*. The existing report template file is built using dummy data which encompass all scenarios for which the framework is applicable (as explained in the Generic Framework Section 2.2: Applying the framework). What needs to be done therefore is to change the data source in *Power BI* in order to reproduce a report with data collected in your project.

This is how to do this in few steps:

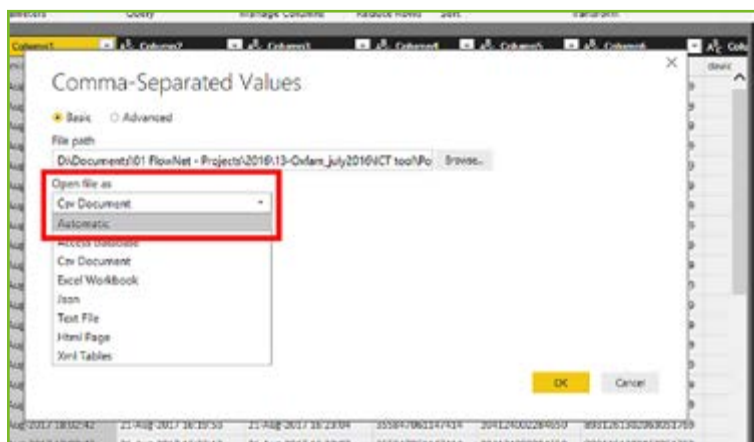
- 1 Open up the Template report to be used with new data source. Choose PBT file from this location: <https://oxfam.box.com/s/k21anp4wjtb1wy92md6ch0a0e8ee5z30> When you open PBT file, you will notice that the name of the file is "Untitled". This is because you open a template and it is expected that you will change data source and save file with the name you want to use.
- 2 When *Power BI* opens, click on Edit Queries in the upper ribbon (as in Figure below)



- 3 New "Query Editor" window will appear. Among Query section on the left hand side select the Data Source that you want to update (see 1 in Figure below), then click on the Cog Icon (Settings icon) next to Source (2) in the Applied Steps window under Query Setting (3 in Figure below).



- 4 Browse to your new Source File and then set "Open file as" to Automatic, and click OK:



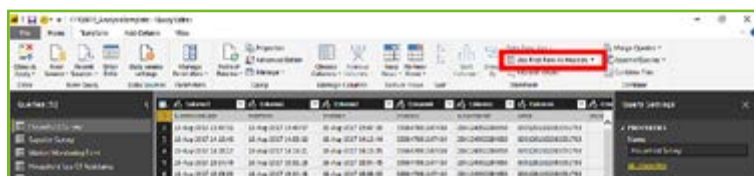
- 5 Your table will disappear but double click on the csv icon that will appear



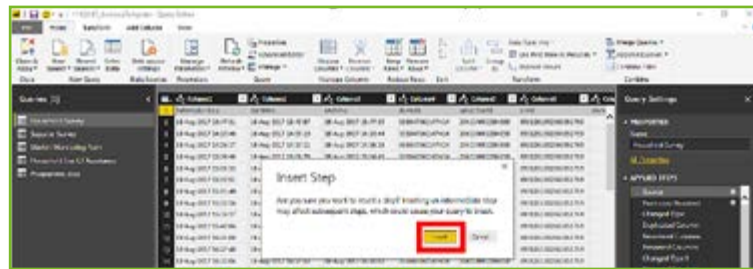
- 6 Click on "Insert" in the dialog box that appears:



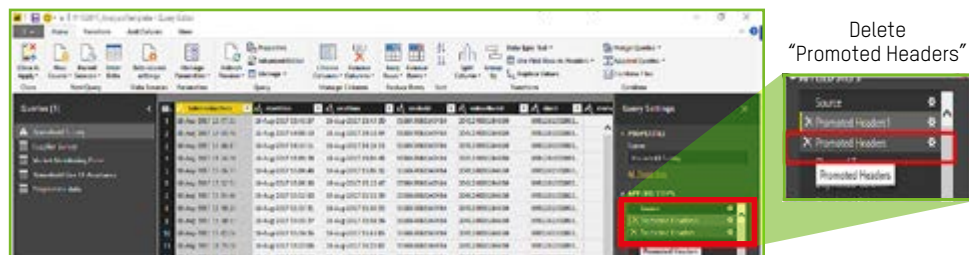
- 7 Now you got your data, but you noticed that Column headers are not as you want them. You need to make text in Row 1 the column header by clicking on "Use First Row As Headers" in the upper ribbon:



- Click on “Insert” in the dialog box that appears:



- You will notice that “Promoted Headers 1” will appear among “Applied Steps” menu in Query Settings in the right hand side section. You can also see “Promoted Headers” step below, which you need to delete (see next Figure for details). This is because when you click on “Apply and close” (see next step) *Power BI* reads these steps as a programme code, and will reverse your previous step and report an Error.



Repeat these steps for all data sources that need change. Delete data sources which you do not use/ need for the analysis. Once you are done, click on “Close & Apply” to apply the changes in *Power BI* interface.

You can find *Power BI* files at:

<https://oxfam.box.com/s/k21anp4wjt1wy92md6ch0a0e8ee5z30>



Use PBT (template) file when changing data source.

Be careful when changing data sources not to mix datasets! If you made a mistake, close the file without saving and start again.

After successful change of data source, save the file with the name you want to use.



The Column names that are used in reporting need to be the verbatim Header names in the data set, otherwise *Power BI* will report an error!

See section “Duplicating questionnaires in Survey CTO for re-use or modification in own programme” for more information.



In case you need to introduce significant changes to existing forms, it is better to add separate questionnaire to address additional project-specific indicators. As data from any source can be added to the analysis in *Power BI*, the advantage is that database structure for generic framework remains the same and the analysis template will not be distorted.



If you are going to repeat the survey again in your programme you can customize your report once and run the analysis later on with different datasets,

Important thing is to also save your file as a report template (PBT) file – which can be used later on with another dataset.

2.3.2 POWER BI REPORT STRUCTURE

Generic indicators, which are presented in the Generic Framework Section 3.1 Indicators overview, are numerated in *Power BI*. This is because *Power BI* has a similar structure to Excel as it works with tabs. As it is not practical to name each tab with full indicators name we introduce numbering as presented in Table 1.

Table 1: Overview of the numbering of Generic Indicators in *Power BI*

Indicator number in <i>Power BI</i>	Indicator name
1. Access to WASH	
Ind 1.1	Proportion of targeted population with basic water services in accordance with the Sphere standards
Ind 1.2	Proportion of targeted population with access to sanitation facilities in accordance with the Sphere standards
Ind 1.3	Proportion of the targeted population who use a handwashing facility with soap and water
Ind 1.4	Proportion targeted population who have access to menstrual hygiene materials and instruction
2. Quality of delivery	
Ind 2.1	Proportion of targeted population satisfied with quality of response (choice, flexibility, and dignity)
Ind 2.2	Proportion of targeted population satisfied with the availability of essential/critical WASH goods and services
Ind 2.3	Proportion of targeted population who are satisfied with affordability of essential/critical WASH goods and services
Ind 2.4	Proportion of targeted population who are satisfied with quality of essential/critical WASH goods and services
Ind 2.5	Average duration of unavailability of essential/critical WASH goods or services
Ind 2.6	Price fluctuations of critical/essential WASH goods & services
3. Market recovery and development	
Ind 3.1	Proportion of supported traders and service providers with access to funding
Ind 3.2	Proportion of traders/suppliers whose trade in essential /critical WASH goods and services, recovered after the event(s)
Ind 3.3	Proportion of supported traders and service providers who provide quality goods and services
Ind 3.4	Proportion of (supported) traders and service providers who report benefitting from market support activities
4. Efficiency-of-delivery	
Ind 4.1	Cost per beneficiary
Ind 4.2	Cost delivery ratio

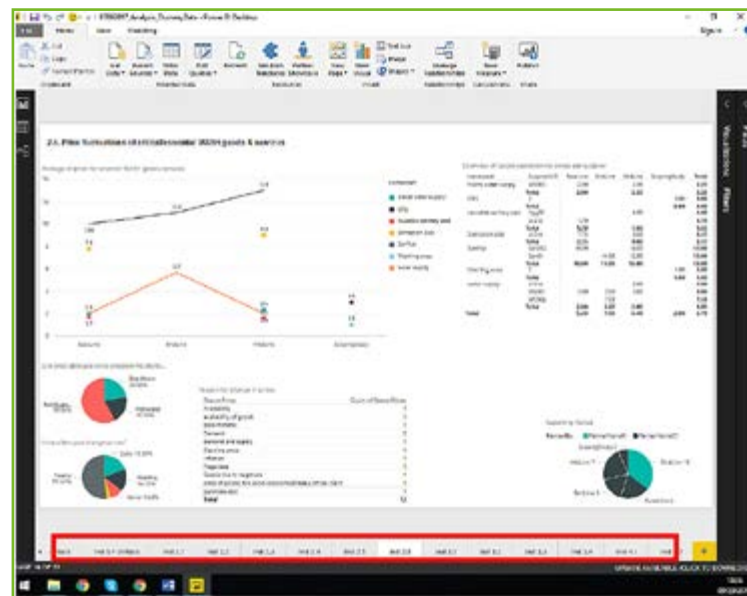
The report is structured in a way that, general project information is presented in first three tabs, following with an overview of Sphere Standards for Water, Sanitation and Hygiene in next three tabs (see screen capture of the lower ribbon below):

Figure 18: Tabs for navigating through the report in *Power BI*



If you navigate through the tabs by clicking on arrows at the left-hand side of the lower ribbon, you will discover another 17 separate tabs for each Generic Indicators (as presented in Table 1 above) with detailed analysis:

Figure 19: Indicator tabs (example showing Indicator 2.6: Price fluctuations of critical/essential WASH goods & services)



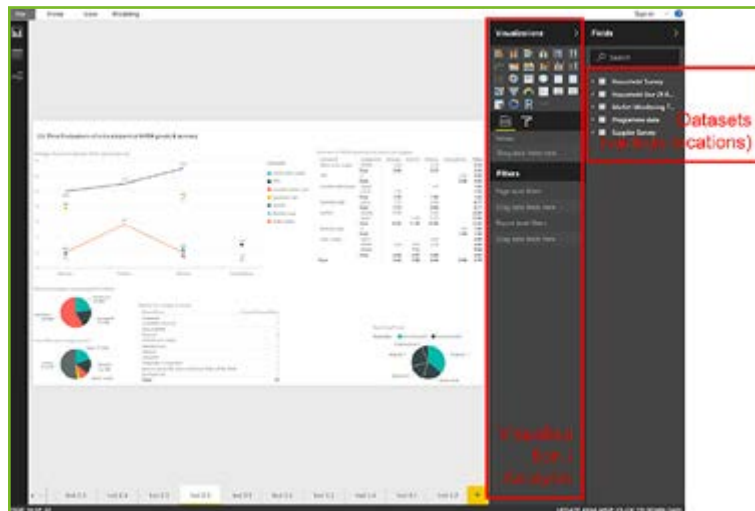
You can modify the analysis at any time by adding or removing charts and tables in each tab. You can also add new tabs by clicking on yellow plus (+) sign on the right hand side of the lower ribbon, or simply delete tabs with indicators that are not relevant to your programme.

POWER BI INTERFACE

A quick walk around the *Power BI* user interface (Figure 20) shows three most important segments:

- 1 The first panel to the right shows various data sets, which can be stored in a variety of locations (see section for more details).
- 2 The middle panel contains a choice of analysis and visualisation. It allows add-ons and linking *Power BI* with other platforms such as "R". The current implementation of the framework is based on internally available analyses and visualisations only.
- 3 The large left panel is the visualisation which can be shown as a dashboard with tabs (desktop version) or as one large report one can scroll through (on-line version).

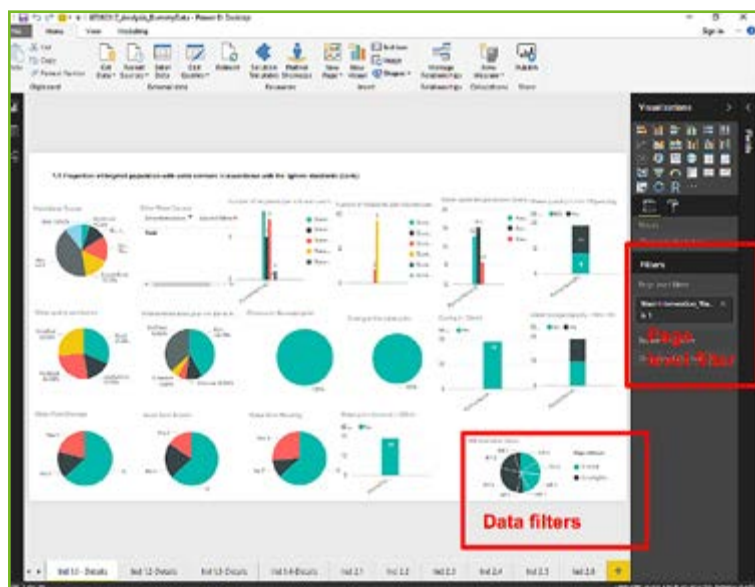
Figure 20: Power BI interface



2.3.3 ANALYSIS OF SUBGROUPS

There are several ways to analyse subgroups in *Power BI*. This is done by using filters. For each dashboard, one can define page level and visual level filters. Page level filters will be applicable to all visuals on a certain page/tab.

Figure 21: Filters in *Power BI* (example of the Generic Ind 1.1: Proportion of targeted population with basic water services in accordance with the Sphere standards)



Generic indicator 1.1: Proportion of targeted population with basic water services in accordance with the Sphere standards is presented in Figure 21. You can see that we used page filter in order to look only at project data related to water supply. If we were to include the whole dataset without using page filters, you would get different results which includes blank / empty cells. In order to avoid filtering these from each chart and table separately, we use page filter instead. Skip logic in questionnaires can give you a clue which page filters are applicable when analysing data.

A very powerful function of this software is that ALL data presented in visuals within one tab is connected, so you can easily disaggregate data on any criteria you want. Note that for every indicator we define filters in lower right hand corner of the sheet – see “Data filters” in Figure 21 above and an example of filter use in Figure 22 below.

In any chart you can filter data by clicking on the legend or an area of the chart you would like to see more details for. In Figure 22, data with bold colour shows end line data. Data is automatically calculated and data labels in charts adjust accordingly. Note that you will be able to see data in charts only for selected criteria.

Figure 22: Using filters in PowerBI



If you are using a pie chart with multiple details to filter your data, you will need to:

- 1 Turn on “Drill down”
- 2 Set detailed view you want to see
- 3 Turn off “Drill down” to be able to filter by multiple groups.

These predefined filters which need to be setup in the desktop version of *Power BI* can then be applied in the web version of *Power BI*.

UNDERSTANDING THE DATA - EXAMPLE

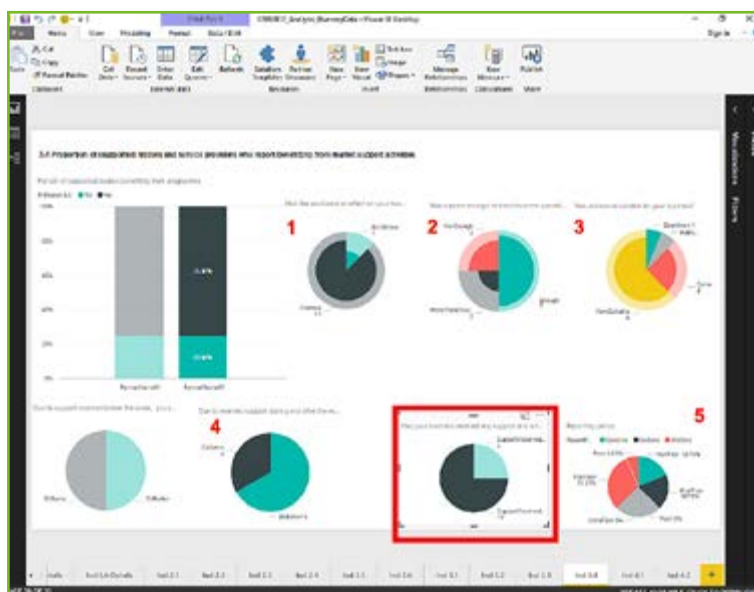
Figure 23 below shows an example of how to use filters in *Power BI* and possible sense making of the data. In this example, there were 2 partners providing support to traders within one programme. We want to see how traders who received support during the crisis did. To do that we click on the pie chart showing % of traders receiving support before, during or after the crisis. Then we can see that Partner 2 provided support to 12 traders during the crisis and that 75% of traders report benefiting from the programme (bar chart).

Looking at the pie charts in Figure 23 (from upper left to right), one can also see that:

- 1 11 out of 12 traders report that support received benefited their business,
- 2 7 out of 12 traders reported that support was enough to keep the business operational,
- 3 11 out of 12 traders reported that support was suitable for their business, and that
- 4 8 out of 12 traders reported they feel they are better equipped to face challenges due to support they received.

It is also possible to see that Partner 2 conducted baseline, midline and endline data collection (5). Data on which filtering criteria is not applicable is presented in lighter colours (as in the left hand side of the bar chart in the Figure).

Figure 23: Using filters – an example of Generic Indicator 3.4: Proportion of (supported) traders and service providers who report benefitting from market support activities



2.3.4 ADDING AN ANALYSIS WITH A NEW DATASET OR A NEW VARIABLE

Adding a new dataset in *Power BI* is well explained in its learning centre – you just use “Get data” in the upper ribbon, choose format and location from where you want to get data (as explained in Figure 17).

Adding an analysis or a new variable to an existing variable, is also well explained in the *Power BI* manuals. New variables that for example are collected in *SurveyCTO* can be found the list in the most right panel in the *Power BI* user interface in Figure 20. The analysis can be added into the most relevant dashboard. If there is no strong fit with any of the existing dashboard a new dashboard can be created as explained in the *Power BI* support material.



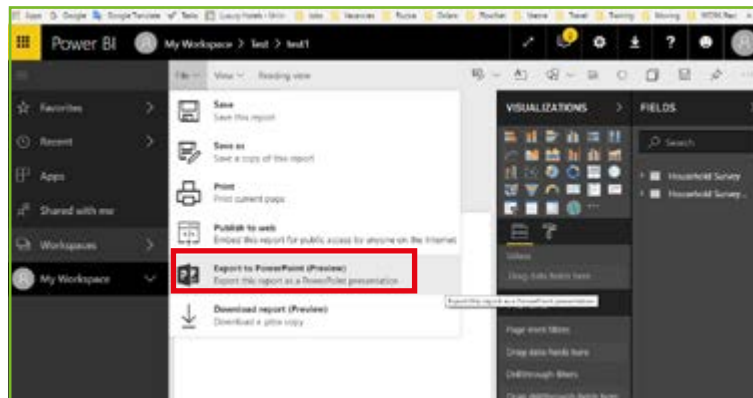
Adding data to the current framework rather than changing or reducing information is by far the easiest option in changes to *Power BI* and *SurveyCTO*

2.3.5 EXPORT VISUAL RESULTS IN *POWER BI* TO POWERPOINT

This is only possible in the on-line version of *Power BI*

- 1 Log in online using your *Power BI* account details
- 2 Choose the report you want to export
- 3 Choose: File > Export to PowerPoint (Preview)

Figure 24: Exporting the analysis in PowerPoint (.ppt) format



It is not clear if there is a limitation in the number of tabs when exporting file to Power Point so make sure you save your file before exporting.



Make sure that before exporting the *Power BI* Dashboard to a PowerPoint file all legend labels in charts are visible. Charts and tables are exported as figures (exporting exactly the same view as in dashboards) and it is impossible to edit these in PowerPoint (PPT) file!

2.3.6 EXPORT, PUBLISHING AND SHARING *POWER BI* REPORT WITH PROJECT TEAM

All the work you do in *Power BI* remains on your personal computer unless you publish them to the online-web version of *Power BI*. Only staff with an identical domain names in their e-mail (anything after the @ for example: yourname@DomainName.etc) will be able to see the report. The unfortunate exception of this rule are the large free e-mail providers such as Gmail, Hotmail, Yahoo where this domain restriction does not work.



For security reasons you can only share the online dashboard with owners of an email with an identical email domain to your email!

It is also possible to export the *Power BI* dashboard (as PBX or PBT file) and share it with anybody as standalone file that then can be imported in either the desktop or the web-based version of *Power BI*. This becomes then a standalone version and any changes will not be reflected in any other dashboard.

2.4 CHANGING DATA SOURCES IN *POWER BI* WITH DATASETS FROM OTHER PLATFORMS

In case that Generic Framework is implemented using a different platform for data collection, it is still possible to generate a report using *Power BI*, provided that question labels are same as ones used in Survey CTO.

There are 2 ways to use data from another platform in *Power BI*:

- 1 Manually clean and adjust the structure of the data to resemble the one from *SurveyCTO*. We recommend this approach as the last resource as it is prone to human error.
- 2 Import data as it is structured in original file and define connections between datasets.

This section provides some points of attention when choosing the second option.

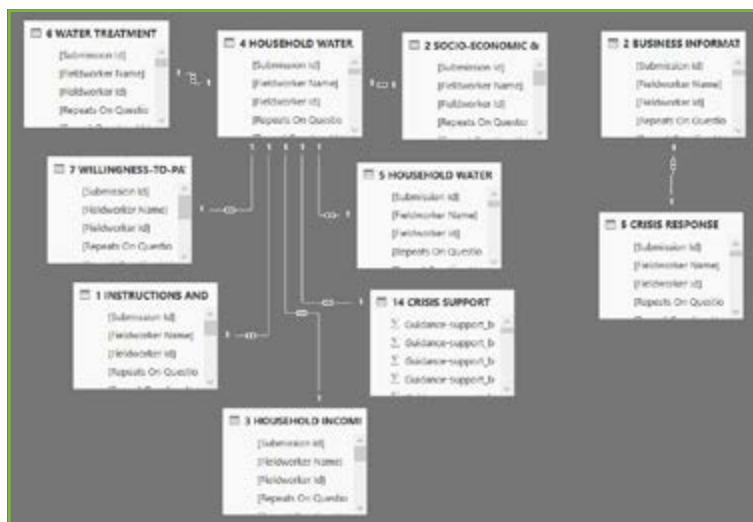


It is extremely important to define unique name of the dataset and connections between these datasets.

When using XLS (excel) files with multiple tabs for data source, one can select one or multiple tabs (depending on the analysis). Selected tabs will be imported in *Power BI* as separate datasets.

If data is imported correctly, *Power BI* will automatically identify the connections between different data sources (as presented in the Figure 25 below). Note that you can manually delete and establish connections between data sets if necessary. Explanations on how to do it are included in *Power BI* learning centre.

Figure 25: Connections between data sources generated in *Power BI*



3 HOW TO ADJUST TOOLS FOR SPECIFIC PROJECT

Your first step in changing the framework or its analysis might be best in the analysis itself. All necessary steps to do that are already explained in sections above. Only when you have done that we recommend you look at changes in the questionnaire. The questionnaire have more questions and answers than are used in the analysis so there a lot of room to expand the analysis.

At first you should probably be only adding a question or making small changes (as explained in section: “Duplicating questionnaires in Survey CTO for re-use or modification in own programme”) but please do regular check that the link to *Power BI* is not broken. *Power BI* has the disadvantage that it is sensitive to changes as explained in section: Importing data to *Power BI*.

If you want to make a lot of changes, there will be a moment that it might be easier to redo the framework questionnaires and analysis, but if you this stepwise and not as a first step, you probably are more comfortable with the whole set-up.

4 ALTERNATIVE IMPLEMENTATION

A combination of *SurveyCTO* and *Power BI* is considered to be a good combination for data collection, analysis and reporting.

However, as mentioned previously, various alternative ICT tools are available that may also be utilised. The main ones are described below.

4.1 ACTIVITYINFO (COLLECTION, ANALYSIS & REPORTING)

This was initially the tool of choice as it had all functions of data collection, analysis and reporting in one piece of software. It might be limited in analysis in some ways but more accessible as a tool for most users than for example *Power BI*. At the time of the implementation all the functionalities required had been implemented in ActivityInfo. However, as these functions had not been fully utilised, some bugs were identified that could not be corrected in time to use in this version of ICT implementation. At some future point, it might be worth revisiting ActivityInfo.

4.2 M-WATER (COLLECTION, ANALYSIS & REPORTING)

Like Activity Info m-Water is an all-in-one software in which we partially implemented the MSE framework. However, the data policy means that data is stored in the USA and falls under US data protection rules. Unfortunately, m-Water has no alternative data hosting outside the US.

4.3 MOBENZI (COLLECTION)

In this assignment we also worked with Mobenzi as an alternative data collector to *SurveyCTO*. While it allows for similar survey forms it exports the data differently.

We did not do a full implementation of MSE framework and did not obtain a trial license.

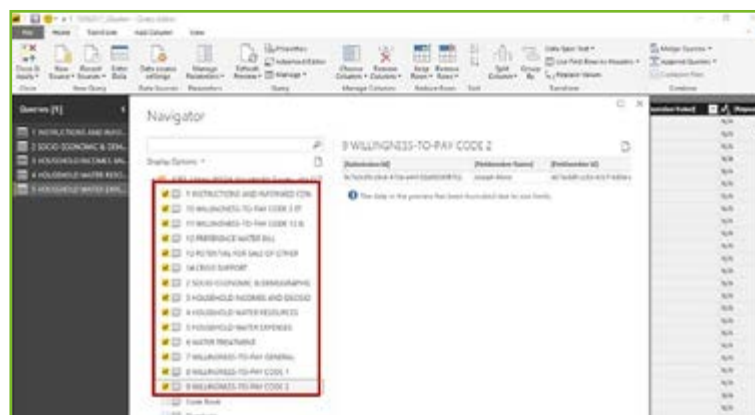
Differences were for example in the exported data structure. For both simple and multiple choice question are stored different columns in the export table in Mobenzi, while *SurveyCTO* stores data for a simple choice answer in one column.

This requires a lot of changes in *Power BI* to change all the simple choice questions.



If data from Mobenzi is used, it is best to choose [Submission Id] as a unique identifier across datasets when analysing in *Power BI*.

Figure 26: Data fields in data exported from Mobenzi



4.4 KNIME (ANALYSIS & REPORTING)

Knime is a fully open source Business Intelligence software similar to *Power BI*. It was proposed and used initially but people found it has a learning curve too steep for this implementation. It is more flexible than *Power BI* in particular for manipulating data but has a different approach to defining the analysis'. In Knime any analysis is visualised as a pipeline in which data is fed, manipulated and analysed. The reporting tool has no WYSIWYG interface and is more challenging to use than *Power BI*.

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Funding from



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