

## Using Technology in Monitoring and Results Measurement

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February 2018

*Collecting, storing, analysing and presenting results measurement information can be time consuming, costly and error-prone. New hardware and software solutions are helping practitioners to save time and money, improve accuracy and present information more effectively to aid in decision-making. This Practitioners' Note profiles three types of tools: device-based data collection, on-line questionnaires and analysis software products. It outlines the pros and cons of each and provides tips from practitioners who have used them.*

### 1 The Challenge

Practitioners often lament how the details of monitoring and results measurement can be time consuming. Information collected from the field using pencil and paper needs to be transferred into a computer program for cleaning and storage and, often, to another program for analysis. This means the analysis of results may not be available for weeks or months after information is gathered. There is considerable information to keep track of, such as intervention plans, contracts, partner reports, monitoring and measurement data collected through multiple methods, geographic locations, pictures and secondary source information. Analysing different kinds of information from multiple sources can be challenging. Finally, aggregating data and consolidating findings for reporting can be arduous. Without careful checks, all these processes are also open to errors.

There are no silver bullets that can do away with the necessity to carefully gather, manage, analyse and interpret information. However, there are a number of new tools – hardware and software products, that aid practitioners with data collection, storage, analysis and presentation. These tools are reducing some of the drudgery associated with results measurement, saving time and introducing safeguards to improve accuracy. Some new software products are also improving the analysis and presentation of information, enabling implementation teams to access and use collected information more quickly and easily.

### 2 Tools and Tips from Practitioners

#### 2.1 Device-Based Data Collection

**What is it?** Device based-data collection means using devices, such as mobile phones and tablets, to record data in the field, rather than pencil and paper. This type of tool relies on both hardware – mobile devices, and software – computer programs to help collect, store and organise data. A questionnaire is put into a computer program and then transferred onto devices via an app. Enumerators fill in the responses to the questionnaire on the devices. Finally, the data recorded is uploaded via the internet to a computer for cleaning and analysis.

**What are the advantages?** Practitioners report that device-based data collection is very useful for surveys. It *saves time and money* by eliminating the extra step of data entry after questionnaires are filled out on paper. Most of the data collection and storage software

products are designed to work with programs for data aggregation and analysis. This makes the time from data collection to analysed results much shorter than in the past. These tools can also *improve the accuracy of data collection*. The allowable answers to a question can be “constrained,” meaning that obviously false data or outliers can be identified during the interview, providing an opportunity for interviewers to ask for clarification from respondents immediately. The software also allows “skip logic” to be built in so that interviewers only see questions relevant to a specific respondent based on their previous answers. As soon as an internet connection is available, data can be uploaded to a central location. This allows a supervisor to keep track of survey progress and check questionnaires for completeness and errors even if they are not in the field with the survey team. Many of the software products are also quite *flexible*. They can accept brief text responses allowing for simple, open-ended questions as well as multiple choice answers. They can also record other types of information such as GPS coordinates and pictures.

**Sierra Leone Opportunities for Business Action (SOBA)** is a private sector development program that uses a market systems approach to facilitate pro-poor economic growth. The program works primarily in agriculture, renewable energy and professional services and entrepreneurship markets. In 2016 SOBA started using device-based data collection for impact assessment surveys. They report saving over USD 2,000 from just one assessment with 200 respondents, easily justifying the purchase of additional tablets for data collection. They also significantly decreased the time it took for assessments while also decreasing errors in data collection.

*Ritesh Prasad, MRM Director, GROW Liberia*

### What are the disadvantages and how can practitioners deal with them?

| Disadvantages  | Tips   |
|--|--|
| Available device-based data collection software products are not appropriate for in-depth interviews where answers are long, and interviewers want to explore topics using flexible initial and follow up questions.   | Only use them for structured interviews with closed ended and limited response questions, such as yes/no responses, ratings, ranking, multiple choice and fill in the blank. Device-based data collection is useful for surveys but not for scoping or exploratory monitoring. |
| While most practitioners report that the software products are user-friendly, some technical skills are required.  | For projects with no in-house technical skills in this area, get some external support initially.  |
| The key, on-going, technical skill required is designing and formatting questionnaires so that they are compatible with the software.  | Designate one person on the team to ‘digitize’ all questionnaires appropriately for the software. Build her/his capacity to do this. Ask her/him to develop guidelines on smart questionnaires for other staff based on experience.  |
| Enumerators may not be experienced in using devices and the software apps. They may also rely too heavily on the app, rushing through questions or not thinking logically during the interview when using a device. This can lessen the quality of the data. | Train enumerators in the use of the data collection app and ensure they practice using it on the devices they will use in the field. In the training, address issues of data quality when using a device.  |

| Disadvantages  | Tips  |
|--|---|
| Mobile devices can be expensive and increase security risks. There is the risk of damage and some devices may not have a very long battery life. While data can be collected offline, an internet connection is required to upload data; this is not automatic for most software products. | Plan in advance for these risks. Discuss the security situation and how to mitigate security risks. Collect and store devices in a secure location at the end of each day. Protect devices with cases. Take power banks to the field. Check availability of an internet connection. Ensure enumerators know where, when and how to connect and upload data. |
| Mobile devices may be culturally inappropriate or intimidate respondents.  | Consider the target respondents' likely reaction to devices. If unsure, test a mini-questionnaire with target respondents to gauge their reactions. Device-based data collection is not appropriate for all target groups.  |

**What software products are practitioners using?** There are many. Those profiled below are the ones that seem to be popular.

- **OpenDataKit (ODK)** is the oldest and is “open source,” meaning that others can freely build on it. The next two are derived from ODK. It is free. <https://opendatakit.org>
- **KoboToolbox** is free. <http://www.kobotoolbox.org>
- **ONA** has free and paid options. <https://ona.io/home/>
- **CSPRO** is free. <https://www.census.gov/data/software/cspro.html>
- **SurveyCTO** has free and paid options. <https://www.surveycto.com/index.html>

They all use a similar basic structure of three tools:

1. “Build” to digitize a survey or set of questions,
2. “Collect” to record information collected in the field, and
3. “Aggregate/Analyse” to consolidate and analyse the data collected. In some programs, this is divided into two tools.

Tools based on ODK are compatible, meaning that practitioners can mix and match the software products, for example, using one product to collect data and another to analyse it. These tools also import from, and export to Excel and Google Sheets. For all the tools above, offline data collection can only be done on an Android device as these tools only have Android apps. Most tools provide the option to collect data online on any device when internet access is available.

**How to choose among the available software products?** When deciding which software product to choose for device-based data collection, these are some things to consider:

- *Does it work well on the devices you have?* Practitioners report that the apps for data collection in the field work better on some devices than others. Check the discussion forums and user feedback for the products to see if they work well with the devices you have.
- *How much support do you want?* Free options tend to have less support, while paid options usually have more. But check the details before choosing.
- *Can you share your data?* Some of the products (for example, mWater) require that users share their data.

- *Do you want a generic tool that is useful for many different fields or a tool more customized to a specific field?* For example, mWater focuses on water and sanitation.
- *How much flexibility do you want in analysis?* Some tools allow for more choices in how data is analysed than others. Some have the option to export data to Excel, while others do not.

## 2.2 Online Questionnaire

**What is it?** An online questionnaire is a series of questions that respondents answer on a webpage. Individual responses are then recorded, made available and aggregated in an online program. The online programs typically also provide basic analysis of the data.

**What are the advantages?** Online questionnaires are *easy and inexpensive* to administer. While the questionnaire must be advertised, there is no requirement to find each respondent. There are also no enumerators, as respondents fill out the questionnaire themselves. Advertising can help to target particular types of respondents, for example by geographic location or using email lists. Online questionnaires are *flexible*; they can gather answers to a variety of different types of questions, including open-ended, close-ended, multiple choice, ratings, ranking and fill in the blank. They also offer “skip logic” so that respondents only see relevant questions and they can randomize the order of multiple choice answers to minimize bias in these types of questions. An online questionnaire can *rapidly reach many people and quickly make results available* for use in decision-making.

**Enhancing Youth Employment (EYE)** in Kosovo supports employment opportunities of young women and men graduates from schools and universities by facilitating their transition to the labour market. The program aims to improve skills supply according to market demand, job matching services and information, and private sector development. EYE conducted an online questionnaire to identify the most effective channels of communication for transmitting labour market information and vacancies. The questionnaire targeted youth aged 14-35 living in Kosovo. EYE advertised the questionnaire on Facebook and got information from 400 respondents in two weeks. EYE found the information received very valuable in identifying efficient channels for providing information on jobs to young people.

*Muamer Niksic, MRM Manager, EYE Kosovo*

### What are the disadvantages and how can practitioners deal with them?

| Disadvantages  | Tips  |
|--|---|
| Only respondents who have a computer and internet access and are reasonably media-savvy will respond to online questionnaires. | Only use for respondent groups with these characteristics. This might include, for example, urban youth, development professionals and some types of business owners.   |
| Respondent sampling may be biased to those who are inclined to answer online questionnaires.                                   | Be aware of this limitation when interpreting results. Supplement online questionnaires with other types of information gathering to capture a broader respondent group.  |
| There is no opportunity to clarify the meaning of questions with respondents.  | Make the questions as simple as possible. For multiple choice questions, ensure that possible answers are comprehensive. Pre-test the questionnaire to ensure that respondents understand questions without additional explanation. |

**What online programs are practitioners using?** The favourite tool among practitioners appears to be **SurveyMonkey** (<https://www.surveymonkey.com>). It provides a very basic option for free. For example, questionnaires in the free option are limited to 10 questions and 100 respondents. There are several paid plans for different needs. Practitioners report that SurveyMonkey is easy to use, requiring few special technical skills. It has a user-friendly interface for respondents and provides templates for questions on various topics. SurveyMonkey responses can be exported to Excel, PDF and other programs. Other tools include **Google Forms** which is free, **Survey Gizmo**, **Checkbox**, **Fluid Surveys**, **Get Feedback** and **Izisurvey**.

### 2.3 Analysis Software

**What is it?** Analysis software is a group of computer programs dedicated to information analysis. They provide options for automated analysis of raw data. Some programs are web-based, while others can be downloaded. The software products that practitioners are using focus on three types of information: quantitative, qualitative and geographic.

**What are the advantages?** Analysis software products make it *quicker and easier* to analyse information. Rather than having to do the analysis calculations manually, the software provides a range of options for automatic analysis of information. The software can be connected to several data sources and provides analysis of the data as it is updated. This can provide quicker and more frequent analysis of results. These tools can make analysis *more effective*. For example, tools focused on qualitative information help to find patterns in qualitative data that would be hard to find through manual analysis. Most software products can *access data from multiple sources*. For example, they can use information from a database of primary data and one of secondary data.

The **Skills Development Programme (SDP)** in Cambodia aims to increase the income and employment opportunities for disadvantaged young people from rural provinces and to contribute to the development of an inclusive and market relevant TVET system. SDP collects relevant data and stores it in an online database. The team then processes the information through Power BI to help analyse the results. SDP has found that Power BI enables quicker and easier data visualization, transforming it into clear graphs, charts and tables, organized into shareable dashboards. The SDP team can now access, understand, interpret and use data more easily.

*Adriana Mendieta, MRM Specialist, SDP Cambodia*

The tools also provide ways to *present information clearly and effectively*, helping project teams to better interpret and use the information. In particular, practitioners are finding that data visualization is making information more interesting for implementing teams and helping managers and staff to better understand and use data in decision-making. For example, software to analyse geographic data can show the adoption of innovations across a geographic area, providing information about where the innovation has and has not spread. Some software products provide *dashboards*, an overview of the data that the software has access to, displayed on one screen. Dashboards usually provide some data visualization and links to more detailed analysis. Dashboards are helping practitioners to organize information effectively and provide all staff with easy and updated access to aggregated results, as well as options for various analyses according to particular staff members' needs. Finally, the tools are *helping with reporting*. Some software products

provide options for automated reports. The data visualisation options are helping practitioners to make reports more engaging and easier to understand.

### What are the disadvantages and how can practitioners deal with them?

| Disadvantages   | Tips  |
|---|---|
| Analysis software can only perform the analysis that it is designed to; customized analysis may not be possible.  | If customized analysis is required, this can still be done using programs like Excel or SPSS either directly from the source data or by exporting the data from the analysis software into Excel or SPSS. Practitioners are finding, however, that analysis software meets most of their needs for analysis.            |
| In order for an analysis tool to use data from many different sources, these need to be effectively linked together and linked to the software. A 'relational database' can be designed for this but that requires technical expertise. | Get started using just one or a couple of independent Excel files as data sources to help determine what the tool can offer and what you may need. For a more comprehensive, customized system, hire a technical expert to design the 'relational database' according to the project's data sources and analysis needs. |
| Fully customized systems can be expensive.  | Carefully consider analysis requirements. A very sophisticated system may not be required to meet analysis needs. Don't get carried away by the possibilities; consider first how the system will concretely feed into decision-making processes.   |
| Some tools require special expertise. For example, SenseMaker requires training. Geographic data analysis tools require some automated mapping skills.  | Consider the expertise required before committing to a particular tool.   |
| Analysis software will not interpret information or provide answers on what a project team should do; some managers may think that analysis software can replace this critical activity.  | Ensure that all managers and staff understand that a software product cannot replace thoughtful interpretation of information in context and creative use of findings to improve project interventions and strategies. Use analysis software to aid in this process, not to replace or constrain it.                    |

### What tools are practitioners using?

Quantitative Analysis Software:

- **Power BI** seems to be the most popular software product among practitioners. It is a Microsoft tool that accesses data from various sources and presents it through an online interface or offline using a downloaded application. It allows for the creation of dashboards. There are free and paid options. The short Power BI videos provide a useful summary of its capabilities. <https://powerbi.microsoft.com/en-us/>
- **Sales Force** is a customer relationship management platform targeted at private companies. It is designed to bring together a variety of information on customers into a single, integrated platform. It has a variety of paid products. <https://www.salesforce.com/au/?ir=1>



### Qualitative Analysis Tools:

- **Nvivo** is software product designed to help organize, analyse and find insights in unstructured or qualitative data like in-depth interviews, open-ended questionnaire responses and focus group discussions. It helps to find patterns in qualitative information. The basic product analyses text-based data sources such as transcripts and responses to open-ended questions. More advanced products can analyse other data sources such as video or audio. It has a free trial and paid options. <https://www.qsrinternational.com/nvivo/home>
- **SenseMaker** is an online tool for collecting unstructured data, organizing and analysing it. Unlike the other tools profiled, SenseMaker is based around a method for data collection, rather than a software product. The practitioner develops the questions and types of data they want to collect while the tool mandates the methodology. The strength of the tool is gathering and analysing stories and anecdotes. To use the tool, practitioners require training. <http://cognitive-edge.com/sensemaker/>

### Geographic Analysis Tools:<sup>1</sup>

There are two types of tools that work together to get and analyse geographic information: GPS handsets or mobile phone with applications capable of getting GPS coordinates for specific locations and Geographic Information Systems (GIS) software that store, analyse and present geographic data.

- Mobile phone applications: There are many. Two examples are:
  - **Get Geo-Coordinates** is a free Android app. <https://play.google.com/store/apps/details?id=com.miin.getgeocoordinates&hl=en>
  - **Locus Map** is a free Android app. <http://www.locusmap.eu>
- GIS Software:
  - **Quantum GIS (QGIS)** is a free and open source software that can be downloaded to a computer. <https://qgis.org/en/site/>
  - **ArcGIS** provides online mapping tools which include maps, apps for data collection, analytics and administration. Several paid plans are available. <https://www.arcgis.com/features/index.html>

## 3 The Bottom Line

Practitioners are finding that adopting new technologies is enabling them to save time, increase data quality and improve the effectiveness of information as an aid to decision-making and reporting. There can be the temptation, however, to let technology reduce, rather than enhance thinking. Carefully considering information requirements and thoughtfully interpreting information to help determine how to improve a project remains at the core of results measurement. Used appropriately, new tools can help practitioners to do that better.

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<sup>1</sup> This section draws on materials by Sylvanus Abua, MRM Manager, Market Development in the Niger Delta (MADE) 2018.

## Acknowledgements

In November 2017, the authors conducted a training workshop with advanced practitioners in results measurement for private sector development. Thanks are due to the Donor Committee for Enterprise Development, the Swiss Agency for Development and Cooperation and the Australian Department of Foreign Affairs and Trade for sponsoring both the workshop and these Practitioners' Notes. The content for the Practitioners' Notes emerged from the presentations and discussions during the workshop. This Note has also benefited from the experience of the practitioners speaking on technology in results measurement at the DCED-BEAM Seminar in Nairobi in February 2018. The authors are grateful to the participants, presenters and facilitators of the workshop and the Seminar for their willingness to share their challenges, insights and tips.

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