

# Terms of Reference: Short-term Advisory Mission for World Service Data Management and IT architecture

## Background

As LWF World Service's project and funding portfolio continues to grow and diversify, there is a growing need to make strategic, data-driven decisions – at project, country and global levels – based on quality information that is produced efficiently and consistently.

Currently, World Service uses a variety of IT and non-IT-based systems to manage and compile data generated from many different sources. Some recent developments include the introduction of Newdea, the LWF online PMER system, and the testing of new modules within LWF's finance system, Sage. These experiences point to the need to review and strengthen World Service's IT architecture as a whole. Key to this is the harmonization of existing systems so that the data can be stored, transformed and used consistently, as well as the introduction of new compatible systems for the processes that are currently neither online nor standardized.

Since the last quarter of 2017, a process launched to consult Country Programs about their data management practices and needs. Regional workshop held in Kenya in October 2017 confirmed that the data management across World Service can be extremely complex and that strengthening these processes will support overall efforts to ensure adequate compliance and accountability at all levels, and to increase efficiency and consistency at all stages, from planning to implementation to reporting to learning. Notably, data management is particularly challenging for the Country Programs working in multiple field locations and in a highly decentralized manner, especially in areas where internet access and IT capacity is not always a given.

As a follow-up, World Service Geneva is now zooming in on specific Country Programs in 2018 to develop and strengthen their country-level data management practices and systems, and to share this learning and expertise with other CPs. The first pilot country is LWF Uganda Program - our biggest Country Program and thus, facing comprehensive data management needs. Already in early 2018, a stock-take of current data management practices in Uganda, including data resourcing, organizing and the existing gaps was undertaken. The findings were presented to the Uganda Senior Management Team, as well as to key staff members from Geneva, during a meeting in Kampala in mid-February 2018.

The main conclusion from the assessment in Uganda is that the proposed new IT architecture and standardized data flow for Country Programs should be piloted. The first pilot will take place in Uganda, and then can be rolled out subsequently to other LWF Country Programs as appropriate. The new IT architecture will allow an easy aggregation of data at country, regional and global levels.

## Expected outcome from the assignment

Before further development of the roadmap (see also Annex 2: Systems Development), LWF World Service is seeking advice from IT firms or consultants with similar experience to:

- *validate the approach and get feedback on the challenges, risks and strategies to mitigate*
- *get recommendations on the implementation strategy, timeline and investment volume needed (money as well as the organization of technical expertise in each scenario)*
- *prepare a short report pinpointing at the main findings and the possible scenarios.*

## Methodology

Understanding the environment of LWF World Service (highly decentralized, limited resources invested in digitalization, willingness to change, but step-by-step approach)

- *Face to face meeting with the team in Geneva*
- *Skype /online exchange when needed.*

## Timeframe

- *Face –to–face visit to World Service Geneva (ideally 15/16 August 2018)*
- *Further exploration as needed.*
- *No more than five days of work in total*

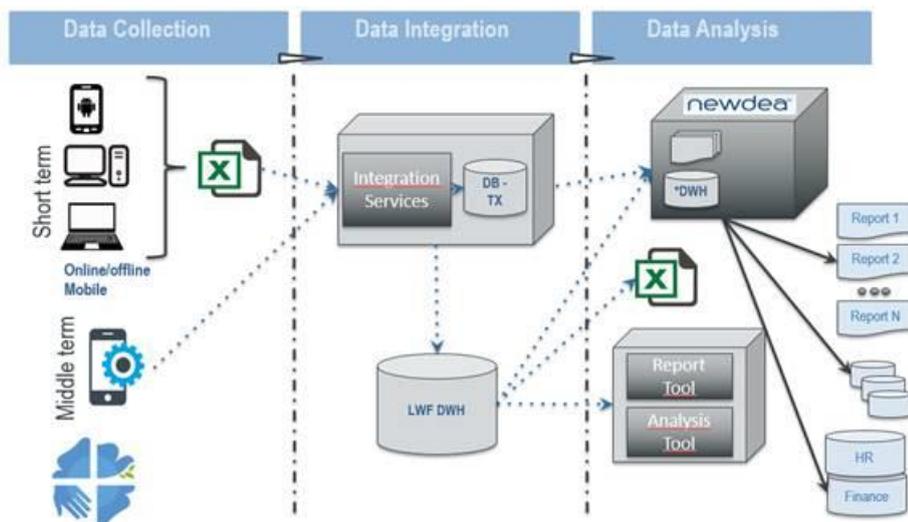
## **Application Procedure**

Applicants are requested to submit a letter of interest for this assignment, showing your expertise and experience with similar projects, methodology and deliverables. Kindly note that this assignment is limited to five days of work. Please submit your letter to: [tender@lutheranworld.org](mailto:tender@lutheranworld.org). The closing date is 30 July 2018.

# Annex 1: Technical reflections on data management at Country Program and global level

## Data Flow:

- Data Collection
  - o Online / Offline tool. Bad Quality Telecommunications in some countries
  - o Self-service solution. 80% of the work related with Design-Develop-Deploy of the forms should be develop in the Country Programs
    - Basic validation rules
    - Reuse of forms
  - o Open to trigger strong validation process
    - Cascade filtering supported by relational integrity. For example: If Country A is selected; should be shown just offices of Country A; If Offices AB is selected; should be shown just Projects related with office AB...
    - Open to use external process as Stored Procedures or WebServices
    - Open to run Bar code or biometric validations
    - Potential use of IoT (Internet of the Things)
  - o We need to support several dimensions:
    - Information related with the Project: Project Status (Actual vs Planned Time; Budget); Global Indicators: Output; Outcome
    - Information required by the Donor: Specific fields required by our Donors (Cross project-Cross country)
      - Basket funded; Bilateral; ACT; External Partner
    - Information related with Thematic Area: Data Model according to the pattern by thematic.
      - Disaster; Youth; Gender; Livelihood; Water; ...
    - Information related with Finance: Information related with tasks (Activity level); Finance code; Actual vs Planned
  - o Consider the challenge related with Data Protection
    - GDPR. Adopted in Switzerland
    - Other normative. According to country and region
    - Best practices as: pseudonymization; anonymization
- Data Integration
  - o Data Cleaning: We need to identify potential errors in Captured...
  - o Data Transformation: We need to translate information with transformation rules (For example: Masculine; Masc; Male; M->all could be translated as Male)
  - o Data Aggregation: We have several dimension in our country programs which creates differences in the organic structure of our operations.
    - Data aggregation per project; per thematic; per country; per Global Outcome; per indicator
  - o We need to collect historical information in a DWH. We would need to model specific datamarts per Country; Donor; Project; Thematic...
  - o We need to extract information (automatically using APIs and Web services) of different Data sources: JSON; XML; RES Client; Excel files; Transactional Data bases...
  - o We need to feed information in different Data Target: (API's and Web services)
  - o We need to support Learning Machines (Middle term use) to manage big amount of data and identify patterns in our information
  - o We could require exclusive access to our information
- Data Analysis
  - o We need Open access to DWH and transactional databases to connect different tools



**Data management:**

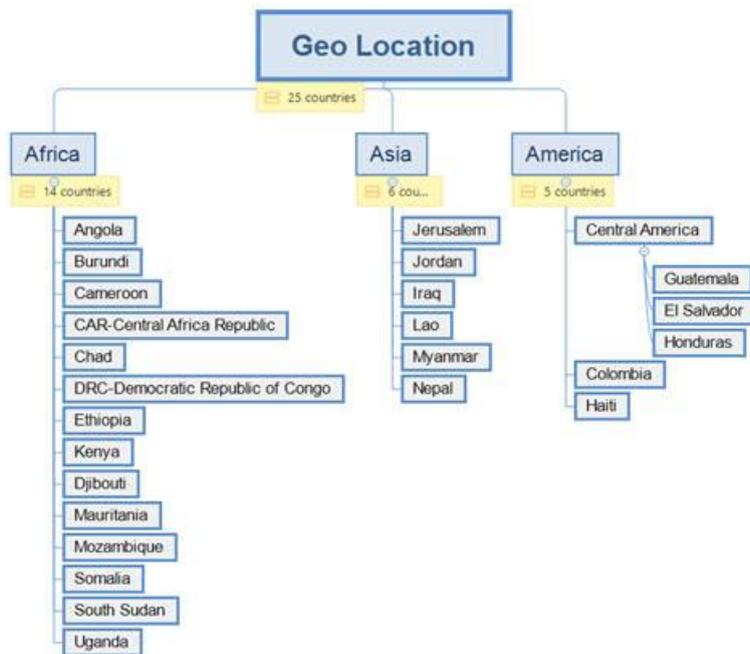
- We collect different type of information
  - o Structured: Information coming of a database or structured excel file
  - o Non structured: Video; photos; Contracts; PDFs;
  - o Social media data: In the future we would collect and analyze social media information
- Different levels of data collection
  - o We need to collect strategic information for Management at Global level
  - o We need to collect detailed information for set controls and reports at operative level
- Data Management
  - o We need to host the information in a form: Secure, Available; Accessible; Consistent; Up to date.
  - o Support the best practices of data management
  - o Support Personal Data Protection

	OPERATIVE Information	Programmatic Information
Structured	Structured Data: <ul style="list-style-type: none"> <li>• Finance</li> <li>• Procurement</li> <li>• Performance</li> </ul>	Structured Data: <ul style="list-style-type: none"> <li>• Project status</li> <li>• Budget</li> <li>• Indicators</li> </ul>
No Structured	Non Structured: <ul style="list-style-type: none"> <li>• Files used in local operation...</li> <li>• Social Media (Facebook; Twitter)</li> </ul>	Non Structured: <ul style="list-style-type: none"> <li>• Project Evidence: Photos, videos, surveys</li> <li>• Live stories</li> <li>• Contracts (donors, providers)</li> </ul>

**Complexity (Geo – Location):**

- 25 countries distributed in 3 Regions
- Every Region/Country have different technical profiles
  - o We don't have Software development teams
  - o Several countries have good Excel practitioners
  - o Several countries have Surveys developers
- The final user requires software tools designed to be Easy-adopted (several communities collect info in paper)
- We need to develop Analysis capabilities in our staff and management
  - o Is required a strong Database - Conceptual Model easy to understand for our users
  - o We requires Open Data bases to Test/Connect different Analysis solutions (including Excel)

- We will run strategic pilots to test and adjust our implementation models. The success implementation models would be roll out at global level
  - Including: Data Base Model; Data Base Conceptual model; Data Integration rules; Data Analysis reports; Processes
  - We need to share the knowledge and best practices developed by our teams



## **Annex 2: Reflections on Systems Development (not implemented yet)**

### **Aims and Rationale**

As LWF World Service's project and funding portfolio continues to grow and diversify, there is a growing need to make strategic, data-driven decisions – at project, country and global levels – based on quality information that is produced efficiently and consistently.

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### **Methodology**

In 2018, World Service activities to develop and test a new IT architecture will focus on four main areas:

- 1. Identify the appropriate IT Infrastructure**
- 2. Data Modelling for Data integration**
- 3. Develop the approach for Data Integration**
- 4. Roll-Out and training**

### **1. Identify the appropriate IT Infrastructure**

Work in this area will include analysis, testing and installation of an optimal IT infrastructure to meet LWF Uganda's data management needs. This will encompass the testing of a local server to host information (Databases, Data Warehouse (DWH), and Folder structure for documents). By the end of this process, World Service Geneva will have more understanding of the server specifications required (e.g. size, backup, processing power, RAM, concurrency, transactions over years, etc.), decisions as hosting strategy (i.e. SaaS – 'Software as a service', local host or third party host) and pros and cons of using certain providers, e.g. MySQL and other Open Source tools or providers with high service levels such as Microsoft, Amazon or Google.

Notably, a key consideration for the decision will be the scalability of a solution, which will allow an easy way of establishment similar set-ups in all Country Programs or a centralized set-up managed globally.

### **2. Data Modelling for Data integration**

Data modelling means design a database structure to store the raw data from several data sources. A centralized database (DWH) integrates data from several sources to make easy reporting and analyse information. Additionally, a folder structure will be defined to store documents (file system) to make easy review, backup and manage the inventory of these files.

A Data Integration tool (ETL –Extract Transform Load-) will allow extracting information of several data sources, and store it in the DWH. ETL is a software tool for automatized data integration and organizing data in a DWH (e.g. clean, transform, aggregate, approve, reject data).

Data modelling includes identifying catalogues of data types, both for documents and for various types of data, such as operational, financial or programmatic.

This area of work will essentially include configuring and testing an 'ETL' (Extract, Transform, Load) for data storage and transformation. In other words, this software will enable data from various sources to be uploaded into a central data-base and then be transformed and extracted in another form. It can be configured so that the information can be imported into another system for comparison or simply extracted for reporting or other purposes.

### **3. Develop the approach for Data Integration**

This area of work will essentially implement a development process to measure the requirements and cost of implement basic, regular and complex Data Integration Packages.

For example, One set of Data Integration Packages could include extract data from Sage (Finance) via the ETL, housed and organized in a specific way in the DWH, and then extracted from this database in another form in order to be uploaded into Newdea (our PMER system). This data flow will give summarized expenditure per outcome for a particular project and can be add value to the cost-benefit analysis in future.

A key piece of work in this area during the pilot testing in Uganda will be the modelling of data in order to facilitate a systematic use of the mobile data collection tool, Kobo.

Questionnaires administered through will collect and upload data at the time of the interview via a mobile device. Once the information arrives in the Kobo collection system, it is then extracted by the ETL and stored in the DWH. Then, via an automated function, the ETL transforms and uploads the data into Newdea to information indicators in project and country results frameworks.

#### **4. Roll-Out and training**

During the first phase, we will identify a technical task force from the country programs that act as sounding board and peers in reviewing the steps taken by the programming team. Once the infrastructure has been set-up, data models have been defined and data integration automated through the use of an ETL, staff in Uganda and neighbouring countries will need to be trained on how to enter and extract the data. Additionally, related IT and PMER capacity to maintain the system within the Country Program will need to be boosted through training and the adjustment of some job descriptions, or indeed the creation of some new positions. To support this, model job descriptions will be developed and some level of training provided by members of the Geneva QAA Team.

Additionally, as the pilot testing progresses in Uganda, World Service will be in a better position to make decisions regarding the replication of such work in other countries, particularly regarding the level to which the infrastructure and data models should be generic and the level to which it should be country-specific.

## Requirements Breakdown

<b>Income</b>		
<b>CoS</b>		
<i>Others (incl. contributions from CP and own reserves)</i>		
<b>Total</b>		
<b>Expenditures</b>		
<b>Component</b>	<b>Activity</b>	<b>Details</b>
<b>1. Infrastructure</b>	1.1 Defining Requirements for pilot (1 year)	Server (Physical Computer) Software Data Analysis (Power BI) -Annual- Software Data Integration (ETL) -Annual- Software Database (DBMS) Software Sharepoint Server (Report Builder) -Annual-
	1.1 Sub-Total	
	1.2 Pilot Final Report	Procurement-Recommendation report Procurement-RFP answered for potential providers Procurement-Server assessment
	1.2 Sub-Total	
	<b>Sub-Total 1:</b>	
<b>2. Data Modelling</b>	2.1 File Management	Consultant-Development
	2.1 Sub-Total	
	2.2 Database Model	Data Model - Country Program DWH Data Model - DWH (Aggregation) Data Model - KoBo (Surveys) Data Model - Operative (Administrative, Finance, HR) Data Model (PMER - Indicators)
	2.2 Sub-Total	
	<b>Sub-Total 2:</b>	
<b>3. Data Integration</b>	3.1 Configure Environment	ETL Development - Package to extract info from KoBo ETL Development - Package linking to Newdea ETL Development - Package to linking KoBo to Newdea
	3.1 Sub-Total	
	3.2 Develop Data Integration package	ETL Development - Complex Packages (5 packages) ETL Development - Regular Packages (10 packages) ETL Development - Simple Packages (20 packages)
	3.2 Sub Total	
	<b>Sub-total 3:</b>	
<b>4. Roll-Out</b>	4.1 Roll-out & Capacity Building	Identifying Technical Task force at country level Face to face meetings in one country Regular Virtual conference calls Communication strategy to the wider user community; newsletter, webinars
<b>Sub-Total 4:</b>		

Geneva, February 2018 (by Saul Figueroa & Ruth Foley, Quality Assurance and Accountability Team)