TERMS OF REFERENCE
SERVICE CONTRACTOR FOR THE

Development of a Data Management System (DMS)

for the Project: "Bringing Back Jobs Safely under the COVID-19 Crisis in the Philippines: Rebooting Small and Informal Businesses Safely and Digitally"

Background

Under the ILO's Safety + Health for All flagship program, the ILO Country Office in the Philippines is implementing the project "Bringing Back Jobs Safely Under the COVID 19 Crisis in the Philippines: Rebooting Small and Informal Businesses Safely and Digitally", or BBJS, with the support of the Government of Japan. The project will be implemented from 15 June 2021 to 31 March 2023.

The overall objective of the project is to contribute to the improvement of safety and health of workers in micro, small and medium enterprises (MSMEs) and informal business, and at the same time mitigating the negative socio-economic impact of the COVID 19 crisis. The project will provide trainings to promote occupational safety and health (OSH) and productivity measures to prevent and mitigate COVID 19 at and through workplaces. Two OSH-related trainings will be conducted: (1) Prevention and Mitigation of COVID 19 in the Workplace with the Work Improvements for Small Enterprises approach (WISE for COVID); and (2) Sustaining Competitive and Resilient Enterprises (SCORE). The project will also promote digital entrepreneurship, or the application of digital technologies in business management and operations, as a way to limit risks from exposure.

To make workplaces safer and more productive in the new normal environment considering COVID 19 risks, an interdisciplinary knowledge management system (KMS) (also referred to in this Terms of Reference (ToR) as Data Management System) will be established and institutional capacity of key partners strengthened for the sustainable delivery of COVID-OSH expertise in the Philippines.

Interdisciplinary Knowledge Management System (or Data Management System (DMS))

For the project's purpose, the KMS will provide a platform to systematically collect **data on OSH improvements in MSMEs and informal businesses as a result of training activities conducted by ILO and its training delivery partners**.

These data will be analysed together with other official data such as **regional epidemiological data**, **surveillance data**, and **administrative data through labour inspection and the employee compensation claims (ECC)**, aiming to adjust training programme and delivery mechanisms and, if appropriate, to develop OSH policies at the

regional and national levels. Special attention will be paid to the effectiveness of outreach and implementation among small and informal businesses as well as any specific sectors and occupational categories deemed riskier in the COVID-19 context.

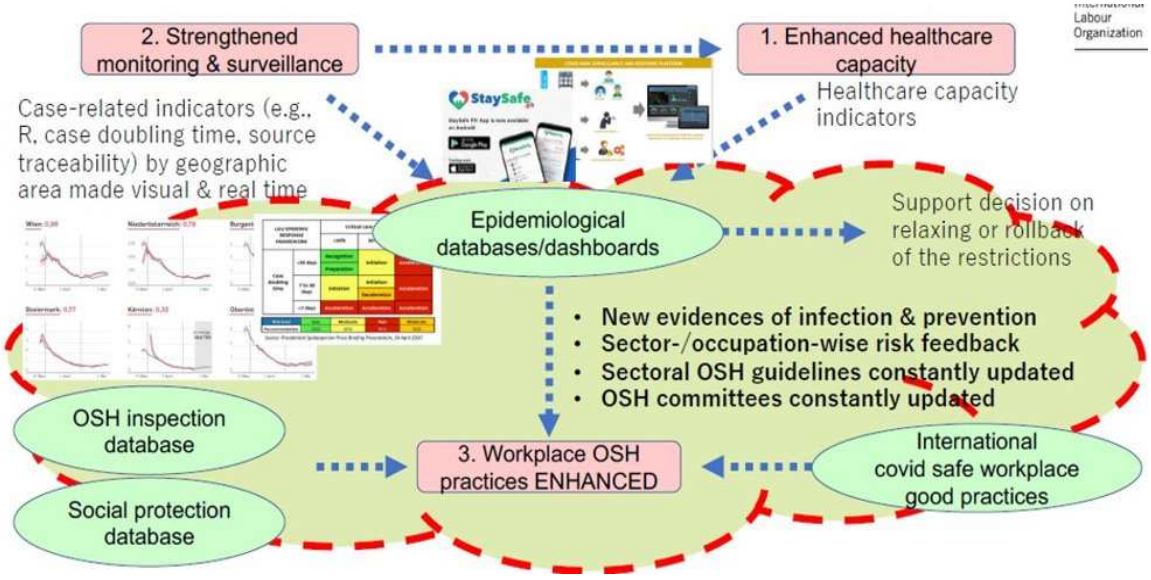
Specific project activities associated to the KMS include:

- Monitor and analyse achievements of workplace training activities, integrating with relevant data such as the epidemiological, surveillance, administrative data and other public health and social security interventions;

- Provide feedback and adjustments to training programme and delivery mechanisms on the basis of the knowledge management system established; and,

- Provide institutional strengthening support as discussed and agreed with the key organizations for the sustainable delivery of the COVID OSH trainings.

The following diagram illustrates the correlation of data from the labor and health sectors and the immediate use of derived information.



The ILO will engage the services of a Service Contractor (also referred to in this ToR as Data Management System (DMS) Developer) to provide advice and technical support in the planning, development, and operationalization of the knowledge management system. The Service Contractor will report to the project's Chief Technical Adviser, while working closely with the National OSH Coordinator, the National MSME Digitalization Coordinator, and other ILO experts and staff.

Key Outputs

The DMS Service Contractor will deliver two main inter-related outputs:

A. The development of the KMS/DMS for the project as illustrated above. The KMS will include a dashboard system that integrates data from different sources such as the ILO, and its partner agencies (e.g., DOLE, DOH, DTI); and,

B. The development of a platform for the management of the ILO project's training-related information, part of which will also be connected to the KMS/DMS.

Specific tasks for the development of the KMS/DMS identified as main output A above:

1. Interact with the project management unit and other teams external to ILO, to obtain data requirements for intended applications of the KMS.
2. Evaluate datasets for consistency, completeness, accuracy, and reasonableness and recommend enhancements.
3. Design, create and operationalize a data management system (DMS) with online dashboard for viewing information. Ensure that technology to be used in the KMS/DMS is consistent with those used/preferred by the KMS/DMS Administrator. *(Note: The ILO will be the KMS/DMS Administrator until the project is ongoing, but this role will be transferred to one of the partner agencies at the end of the project. It is important the technology used in the KMS/DMS is amenable to both the ILO and the identified future KMS/DMS Administrator.)*
4. Perform data analysis using statistical tools and establish regular report running schedule and process. The DMS must be able to generate data reports on periodic basis.
5. Implement measures to ensure data integrity and security, consistent with policies and procedures of ILO and the DMS administrator.
6. Present the data management system, showing complete functionality.
7. Address any issues, questions, and problems in accurate and timely manner before turn-over of the DMS to ILO.
8. Conduct trainings for the use and administration of the DMS, with prepared instruction and trouble-shooting manuals.

Specific tasks for the development of the ILO project's platform for managing training-related information identified as main output B above:

1. Interact with the ILO BBJS project management unit, ILO staff and experts, to determine data to be collected, data formats and sources, means of data collection, platform for data storage and processing, data analysis and report-generation, dashboard-type monitoring.
2. Develop, enhance, and maintain datasets for the ILO BBJS project.
3. Recommend options for data storage, data analytics programs to use, dashboard system for monitoring; and carry out the chosen options accordingly.

4. Link specific information from the ILO project's platform to the bigger KMS/DMS being developed.
5. Address any issues, questions, and problems in accurate and timely manner before turn-over to the ILO project team.
6. Conduct trainings for the use and administration of the ILO project's platform for managing training-related information.

Stack requirements

Back-end: The Contractor is required to provide suggested infrastructure diagrams and minimum/recommended technical requirements for processing and memory.
The server-side part of the application should be built using a modern open-source web framework such as Django, Laravel, Express etc. The backend application will expose a REST API through which it will interact with one or more frontend interfaces (currently one) and allow stable data import and export from databases (supported file type should include: .xls, .txt, .csv, .pdf etc.). The language for backend development (PHP, C++, Java, Python etc.) will be used according to the selected framework.

Front-end: The client-side part of the application contains the interface design for the inspection modules and direct interactions with users. The frontend interfaces will be responsive and well-performed built using a flexible open-source framework and library such as AngularJS, React.js, jQuery etc. The language used for frontend development will include HTML, CSS, and JavaScript.
The back end and front-end systems will work together and connect with each other via a RESTful API (REST API). Access to the API will be HTTPS-only and limited to authenticated users.

Database: Open-source database such as MySQL or PostgreSQL. The logical design of database development should cover conceptual data model into a database schema of normalized relations (tables) with referential integrity implemented. All parameters for security, recovery and backup will be specified as well.

Web Server: Open-source web server such as Nginx or Apache, as agreed with the stakeholders

Best practices

Agile: The Contractor will follow an agile approach. The stakeholders will be regularly updated on the progress and issues. In turn, feedback will be provided to allow the Contractor to fine-tune the modules and reach milestones in a time-efficient manner. The Contractor will arrange recurrent meetings per an agreed schedule to present progress and current issues requiring inputs.

- Full HTTPS: The application will run completely on HTTPS (TLS). All calls to APIs will be over TLS.
- Cross-browser compatibility: The application will work on modern devices (desktop, laptop, tablet, smartphone) with a recent release of any popular web browser and perform responsive interface on each type of devices.

- Loading time: In the case of good internet connectivity, the application will have a fast loading and rendering time. The application will be optimized for slow connections by the use of local caching and performance optimization techniques.
- URL routing: According to HTML and URL routing best practices, different parts of the application will be reachable via different URLs (i.e., red routes). The API will define CRUD routes to access data from the database.
- Coding style guides: The Contractor will indicate whether they will follow coding style guides such as PEP8 for python.
- CI/CD pipeline: The Contractor will follow adequate process for code repository management, versioning, and deployment pipeline, preferably using git-flow convention or similar.
- Configurable filtering, sorting, bookmarking, or aggregation.
- Interactive dashboard with pivot tables, charts, images, or rich text.

Core/management features

- Register and Log in with email verification and hashed password.
- Password reset (via email) with password hashed.
- User and entitlement management (role-based access control)
- Logging: all CRUD actions taken by users (login, logout, save, upload) should be logged in the database (who, what, when, source IP)

Security

The application should comply with OWASP Secure Coding Practices as listed in the checklist: https://www.owasp.org/index.php/OWASP_Secure_Coding_Practices_Checklist
In particular:

- the very sensitive information (user passwords for example) will be encrypted using Bcrypt2 or similarly industry-accepted mechanisms
- Captcha verification or Multiple Factor Authentication to avoid brute force log in attempts, to be agreed with stakeholders

ILO and its partners reserve the right to perform spot checks, code analysis and vulnerability scanning before going to production. If issues related to code are identified, the Contractor will fix these issues until the stakeholders' satisfaction.

Carry out an acceptance review of the system

- Application codes should be fully developed and reviewed, project requirements must be matched, all the reported defects and feedback from piloting process should be fixed and tested, environment for User Acceptance Testing (UAT) must be ready;
- Conduct user acceptance testing;
- Record the running results, correct and re-test any defects founded, or bugs detected.

Finalise the system and develop a handover package

The Contractor shall improve the system, correct the gaps and mistakes to ensure the smooth application of the system.

The handover package provides information on:

- All administration authorization and source code
- User Rights Matrix (entitlement matrix)
- Database structure diagram or UML diagram
- Workflow and structure diagram of the application
- Application Framework Information (allowed administration rights for access and edit the application contents and interface)
- Coding guidelines, rules and standards Design elements raw files, visual guides
- Server administration guidelines - installation, backup, server configuration, basic troubleshooting guides
- Updated procedures, data handling and protection protocols.
- A sustainability plan in the medium to long-term advising on system and software maintenance and support, including the necessary staffing and technical knowledge/skills that are required for this purpose.

Deliverables and Schedule

Deliverables	Expected Completion Time (in working days)
A. Development of the KMS/DMS	**26**
1. Datasets from the external partners secured.	3
2. Evaluation report on the datasets submitted.	1
3. DMS functional and dashboard system operational.	15
4. Produce initial reports from data analytics.	1
5. SOPs and system in place for data integrity and security.	1
6. Presentation and demonstration done, and materials submitted.	2
7. Records of technical support to issues and problems encountered, and their resolution.	1
8. Report on trainings and operations manual submitted.	3
B. Development of the ILO project's platform for managing training-related information	**12**
1. Summary report on ILO project's data structure and needs	1
2. Datasets for the ILO project developed and established	3
3. Data storage, analytics, and dashboard-type monitoring system in place	5
4. Data from the ILO project linked to the bigger KMS/DMS	1

5. Records of technical support to issues and problems encountered, and their resolution.	1
6. Report on trainings and operations manual submitted.	1
TOTAL	**38**

Confidentiality Statement

All data and information received from ILO for this assignment are to be treated confidentially and are only to be used in connection with the execution of these Terms of Reference (TORs). All intellectual property rights arising from the execution of these TORs are assigned to the ILO. The contents of written materials obtained and used in this assignment may not be disclosed to any third parties without the expressed advance written authorization of the ILO.

Administration, Reporting and Coordination

The contract for this assignment will be issued by the ILO Country Office in the Philippines (CO-Manila). Workspace, equipment, and other logistics arrangements in the implementation of the activities, in particular including the internet connectivity and web meeting devices required under the present telework environment will be organized and born on the account of the ExCol consultant The consultant will report to the Chief Technical Advisor (CTA) of the project and liaise closely with the OSH Coordinator of the project. The consultant will also coordinate closely with the Enterprise Development Specialist of CO-Manila and the SCORE Global team in headquarters as well as the Programme team of CO-Manila as appropriate. The final approval on reports and payment will be done for the ILO Country Director for the Philippines.

Duration of the Assignment

The work will be carried out between **15 July 2022 to 31 October 2022**. All deliverables have to be completed by 30 September 2022. The additional month of the contract is reserved for technical reviews and processing of final payment.

Contract Value and Payment

The Consultant will be paid professional fee based on daily rate multiplied by **38** workdays, upon completion of all the work to the satisfaction of the ILO.

Payment Schedule (Refer to sections on Key Tasks and Outputs, as well as on Deliverables, for details on required reports/documentation):

1. First payment (30%) - upon submission of invoice, ILO and partner datasets, and evaluation report as described in Deliverables A- 1 & 2, and B- 1 & 2.

2. Second payment (40%) – upon submission of invoice and completion of a functional KMS/DMS with operational dashboard system to the satisfaction of the ILO; and functional training information management platform for the ILO, as described in Deliverables A-3, and, B- 3 & 4, respectively.

3. Final payment (30%) – upon submission of invoice, reports from data analytics, establishing systems for data integrity and security, demonstration done and submission of presentation materials, submission of report on issue resolution, trainings done and submission of operations manual, all to the satisfaction of the ILO as described in Deliverables A-4, 5, 6, 7, 8, and, B-4, 5, 6.

No travel is envisaged under this contract. The cost of organizing online meetings will be borne by the consultant unless there is a prior agreement for ILO to organize one. Any other associated costs such as communication and small expenditures are expected to be included in the contract.

Qualifications and Experience

The Service Contractor must have the following qualifications:

Education: First-level university degree in computer science/engineering, business management, data analytics, or related technical courses.

Experience: At least 5 years' experience in developing and implementing data management systems or similar information systems.

Experience of designing and implementing similar systems for international organisations or the public sector;

Quality commitment: Strong commitment to quality and a thorough approach to the work; Previous work experience for the ILO or UN agencies is an advantage; Examples of the results of previous projects.

Languages: Good command of English

Expression of Interest

Interested candidates must submit the following: *i) Letter of intent, ii) Proposal based on the published TOR, iii) CV and iv) Accomplished/signed Annex I and III section of the RFP/RFQ form*.

The documents must be submitted to **Ms Josefa Bacal**, *COVID-OSH Coordinator*, for the project "*Bringing back jobs safely under the COVID-19 crisis in the Philippines: Rebooting small and informal businesses safely and digitally*" at bacal@iloguest.org, with copy to **Mr Jayson Umaguing** at umaguing@ilo.org, *Programme and Administrative Assistant*, on or before **15 July 2022**, 5:30 pm (Manila time).

Only shortlisted candidates will be contacted for the final selection.