

A Networking Success: The Role of the Philippines' DOST OneLab Network in Ensuring Food Safety for both the National and International Markets

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Abstract

In 2014, the Philippines' Department of Science and Technology (DOST) has established the one-stop laboratory system for global competitiveness. Knowing the Philippines as an archipelagic country, with cities and communities separated by bodies of water, and with the fact that not one laboratory can cater into the wide variety of test and calibration requirements of various stakeholders, the Department decided to establish a network of testing and calibration laboratories, providing a linkage between stakeholders and the laboratories with capabilities. These laboratories are accredited by the Philippine Accreditation Bureau (PAB) of the Department of Trade and Industry (DTI), the country's accreditation body, based on Philippine National Standard (PNS) ISO/IEC 17025:2017. The standard sets general requirements for the competence of testing and calibration laboratories. For almost a decade now, the network has already grown into 59 network member laboratories in 2023, coming from both government and private sectors, even from laboratories located in Malaysia, Thailand, Vietnam, Australia, and the United Arab Emirates (UAE). Many of these member laboratories come from testing laboratories which are being utilized to address the increasing needs from various stakeholders for testing of foods and food products to ensure safety and quality, meeting national and international requirements and standards. Through the network, micro, small and medium enterprises (MSMEs) in remote areas of the Philippines can now have access to testing services to check if their foods and food products are complying to quality requirements and are safe for consumption. This innovative solution has enabled MSMEs produce globally competitive food products able to penetrate the international market through the economies' Mutual Recognition Arrangements (MRAs), since products are tested by accredited laboratories based on PNS ISO/IEC 17025:2017. For years, the network has helped various sectors: (a) the regulatory bodies in the performance of their function to regulate foods and food products for the strict implementation of Republic Act (RA) 10611 or the Food Safety Act of 2013; (b) the big companies and MSMEs which don't have internal quality assurance laboratories for their food quality and safety assessments, meeting requirements of their own customers; and (c) the policy makers for the development of food safety national and international standards from scientific data of the local settings in the Philippines. As what the theme of the 2023 World Safety Day states, "Food Standards save lives," the DOST OneLab has

been influential not only in the monitoring of food safety and quality in the country, but as well as in the contribution to the development of food national standards through the technical expertise provided by DOST.

Keywords: Food safety and quality, laboratory network, testing laboratories, ISO/IEC 17025:2017

1. INTRODUCTION

The Philippine government through DOST has consistently extended support to MSMEs by creating a supportive environment for them to realize their full potential through science, technology and innovation. One of these science-based services is the OneLab, which broadens public access to testing and calibration services at a single touchpoint through an IT-based platform.

OneLab addresses the need for connectivity of various stakeholders for testing and calibration services given the limitation of the archipelagic state of the Philippines. Not one laboratory can cater to the growing demands of various stakeholders, thus, the significance of the network has led to the increased productivity of the micro, small and medium enterprises (MSMEs), manufacturing firms, and R&D institutions because their needs for technical services to comply with regulations and quality specifications are addressed through the OneLab referral system with members not just from DOST laboratories but also from other government agencies and private institutions. OneLab-member laboratories have helped MSMEs comply to national regulations on food safety, environmental protection and product quality, as well as to the requirements of the international trade because of the accreditation under ISO/IEC 17025:2017 through the mutual recognition agreement (MRA).

In this proposed project, new and better initiatives to support MSMEs, manufacturing firms, and R&D institutions are drafted to help the Philippine economy move forward and make it even more resilient despite the threats of unfavorable global environment. This project will sustain its services to customers while expanding some of its capabilities to address the former's needs in terms of expanded laboratory testing and calibration, research and

OneLab has truly changed the landscape of how DOST provide testing and calibration services to its customers. It is

an innovation in service delivery that integrates all network members through the use of information technology to provide its customers easy access and wide-ranging service offerings at a single touch-point. As one of the core services of the Department, especially in the regions, the need to sustain the laboratory operations is essential.

The project aims to sustain and level-up the services of DOST laboratories to include provision of shop-floor R&D and training and consultancy services. Alignment of laboratory services to support the programs of DOST such as Halal, Food Innovation Center (FIC) and Food Safety and the needs of key customers like the export firms, MSMEs and PEZA locators shall be made by offering new tests and calibration as well as weaning out services that are being offered by laboratories in their area and those that are not frequently requested.

Collaboration with LGUs, SUCs, HEI shall be established to build their capability as sample receiving stations, facilitate sharing of equipment and other resources.

OneLab commits to deliver 6Ps outputs and provide support to MSMEs to transition to Industry 4.0 as an outcome.

The Mandate of the Research and Development Institute:

The Industrial and Technology Development Institute (ITDI) is one of the research and development (R&D) institutes of DOST. It has the following mandate:

1. Undertake applied research and development to generate new knowledge, technologies, and innovations in the field of industrial manufacturing, mineral processing, and energy;
2. Conduct knowledge translation or technology transfer and commercialization; and
3. Provide technical services, tests and analyses, and metrology to ensure international traceability of the national units of measure.

“To contribute to making local industries globally competitive” is the mission of ITDI. Through its various R&D and technical services divisions, it helps local industry produce products meeting regulatory and international standards, ensuring safety and quality. The ITDI renders a variety of scientific and technological services to its customers i.e. industry, academe, etc. It has a vision of being the “Leading industry partner for Science, Technology, and Innovation.”

The Standards and Testing Division (STD) of ITDI is one of the technical service divisions of the Institute established under Executive Order No. 128, dated 30 January 1987. It is dedicated to rendering testing and other technical services to the public and private institutions and individuals. The STD provides biological, chemical, and physical and performance testing of materials and products for quality and safety. It continuously improves the established and maintained Laboratory Quality Management System (LQMS) to cope with the advancement in terms of technical service and cater to the requirements of various industries. The STD exists to assist the industry to be globally competitive. It recognizes

that the major resource is its people and sustained expertise development is its major goal. It strives for excellence and sustainability in everything the Division does and uses current/updated test methods and instruments for tests and analyses.

OneLab has been in existence since 2014, and throughout its project implementation it has provided the much needed laboratory services to the MSMEs, export manufacturing firms, government agencies, hospitals, researchers and students to name a few. The laboratory services provided had facilitated MSMEs to meet product regulatory requirements to be granted FDA license to operate, export manufacturing firms to meet market requirements, and students to complete their researches. In a survey conducted by OneLab in 2020 to determine the future needs of its current and potential customers, aside from the test and calibration services, the customers expressed their need for an R&D service for their product development and improvement to be able to address the changing customer demands and be competitive in the market. The laboratory services and its attendant reports provide objective evidences for regulatory agencies to make decisions to ensure consumer safety and product quality. With its essential role in helping spur economic activities especially during this pandemic, OneLab indeed has to be sustained and supported, hence this proposal.

The Smarter OneLab for Industry 4.0 through Testing and Calibration, Education and Discovery (OneLab for TED for brevity) project will not only focus on providing tests and calibrations, but it will also provide shop-floor R&D activities (DISCOVERY) as well as be a mentor to other government and private laboratories by providing training programs (EDUCATION) to enhance the skills and competence of their manpower.

This project will sustain the provision of tests and calibration services to customers while advancing its infrastructure and facilities to adapt to the needed services in the country. Preparations for decentralization of specialized services of some RDIs will be done during this project. All activities lined-up are planned in response to the growing testing and calibration requirements brought by the fast-paced regional economic developments.

The 2020 List of Establishments of the Philippine Statistics Authority (PSA) recorded a total of 957,620 business enterprises operating in the country. Of these, 952,969 (99.51%) are MSMEs and 4,651 (0.49%) are large enterprises. Micro enterprises constitute 88.77% (850,127) of total MSME establishments, followed by small enterprises at 10.25% (98,126) and medium enterprises at 0.49% (4,716).

Together, these MSMEs generated a total of 5,380,815 jobs or 62.66% of the country's total employment. The micro enterprises produced the biggest share (29.38%) closely followed by small enterprises (25.78%) while medium enterprises were far behind at 7.50%. Meanwhile, large enterprises generated a total of 3,206,011 jobs or 37.34% of the country's overall employment.

In a report submitted by the OneLab Project Management Office entitled: “Summary Report of the Survey on Current

and Future Needs for Laboratory Services of Department of Science and Technology (DOST)”, 26% of the 884 respondents are interested in availing R&D services for both product development and product improvement.

Some customers have also expressed plans for expansion towards the national and international market. However, some factors such as financing, and equipment acquisition for quality control have slowed them down in achieving this goal.

Considering that a major source of the country’s labor force come from MSMEs, it can be considered as one of the key factors that play a significant role in the economy. Providing them with assistance through easy and convenient access to laboratory services relevant to in-plant process quality control, standard conformance, product registration and other regulatory requirements will result in the production of safe, enhanced, and competitive products in the market. A competitive environment encourages MSMEs to constantly improve their products and services.

Another factor considered for this project is the Mandanas-Garcia ruling. This ruling resulted from the petition made by Batangas Governor Hermilando Mandanas and former Bataan Governor Enrique Garcia Jr. before the Supreme Court on local government shares on internal revenue allotment (IRA). According to the petitioners, LGU shares should include all national taxes. The Supreme Court affirmed that local government units are entitled to a “just share” on all national taxes collected and not only from the Bureau of Internal Revenue (BIR).³ While the SC ruling’s effect is straightforward- greater amount of resources for LGUs in implementing devolved functions- there are concomitant and equally important issues that the National Government needs to contend with. Complete devolution of functions related to National Government- funded and administered programs, activities, and projects (PAPs) has its challenges and requires time. Hence, a gradual devolution of functions can be expected.⁴ Transition towards full devolution involves capacitating the Local Government Units (LGUs) to ensure that the devolved services will continue to be provided and that the Filipino people will benefit under a decentralized setup.

Collaborations are expected during the OneLab for TED implementation because of the foreseen devolvement and decentralization of certain services. OneLab will assist the LGUs by providing continuous assistance to MSMEs and other stakeholders during the devolution process. Also, OneLab will support LGUs by providing them with capacity building trainings and other activities aligned with the objectives of the devolution. This involves not only the technical know-how but also includes improving the local systems and processes of the receiving party.

To grasp a wider picture of the testing and calibration situation in the country, OneLab has conducted a survey in 2019 entitled “Survey of Testing and Calibration Laboratories in the Philippines”. Some of the significant information gathered are the analytical testing and calibration services commonly offered in different regions and those which are needed but are not yet offered by the DOST laboratories. Through OneLab for TED’s upgrading of

services, commonly offered analytical tests and calibration services will be weaned out to gradually focus on offering the identified emerging needed services which are not yet available.

OneLab was realized in 2014 with DOST laboratories forming a network supported by strong IT interface. To date, the network has grown to 57 members whose laboratory services are integrated and provides the Filipino people an easier and more convenient access to analytical testing and calibration services. Through OneLab for TED, the existing services provided by the network will be strengthened and upgraded to meet the current demands of the MSMEs, LGUs, SUCs and other stakeholders. Expansion of the services will be done through upgrading and provision of new facilities, infrastructures, equipment, shop-floor R&D and forging of linkages.

2. METHODS AND PROCEDURES

Conceptual Framework

Figure 1 presents the Conceptual Framework of the OneLab for TED Project, which is used as a guide in the implementation of the activities to enhance testing services in the country, position DOST OneLab as a training provider to continually improve competence of laboratory personnel, and the conduct of research and development which initiates innovations in analytical test methods and quality assurance and support needs of stakeholders for product developments and improvements.

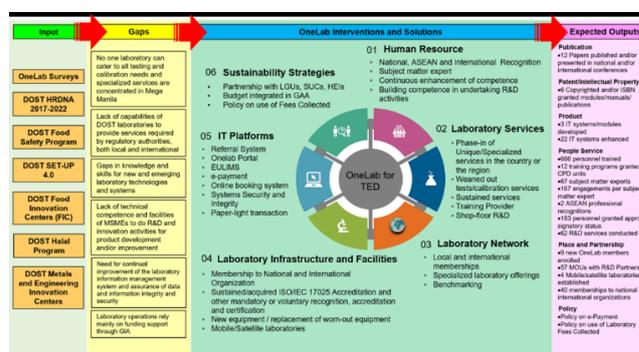


Figure 1. OneLab for TED Project Conceptual Framework

Road Map

Figure 2 presents the Road Map of DOST OneLab which outlines the planned activities to fulfill overall strategies on the following areas:

1. Human Resource;
2. Laboratory Services;
3. Laboratory Network;
4. Laboratory Infrastructure and Facilities;
5. IT Platforms; and
6. Sustainability Strategies.

All the activities presented in the road map leads to the realization of the DOST OneLab vision which is “By 2030, smarter OneLab is a network of globally renowned laboratories distinguished for quality, proficiency, and

- but will also include other management and soft skills enhancement.
- Expand the accreditations of DOST OneLab as CPD provider for a wider scope of regulated professions, i.e. Chemical Technicians, Chemists, Medical Technologists, Engineers, among others, helping both personnel of DOST OneLab member laboratories and stakeholders.
 - Higher level of personnel competency and recognition shall be sought through the ASEAN MRA Professional Scheme.
 - Provide mentorship support to other analysts from other laboratories or laboratory consortia as well as to on-the-job trainees. This will not be limited to skills upgrading but also to assisting laboratories in developing laboratory quality management system.

Objective 3: To provide shop-floor R&D and innovation activities for MSMEs' development, allowing it to survive and thrive in competitive markets

- Shop-floor Research and Development services will be offered by select RSTLs and RDIs relevant to the needs of the industry in the region. The SET-UP beneficiaries, FIC customers and Halal program customers will be the entry points for R&D activities. Memorandum of Understanding (MOU) will be used as means of verification for the R&D activities, and will formalize the linkages forged by select DOST laboratories with other organizations.
- Results of R&D activities will be presented in a national or international scientific conference to contribute to knowledge sharing.

Objective 4: Sustain and enhance the laboratory quality management system and the laboratory information management system through incorporation of Internet of Things (IOT) and robust security features

- Implementing agencies shall undertake activities such as internal audit, enrolment to PT programs, adherence to quality assurance measures to ensure continual accreditation to ISO/IEC 17025:2017. Additional scope of test parameters and additional signatories shall be targeted. Regulatory and voluntary accreditation and recognition of laboratories from FDA, DOH-HFSRB, DENR-EMB among others shall continuously be pursued.
- The Enhanced Unified Laboratory Information Management System (EULIMS) will be completely deployed to all member agencies, with upgrades incorporated relative to its various modules/features.
- Security of OneLab IT systems and data integrity shall be top priority and will be achieved through the periodic conduct of Vulnerability Assessment and Penetration Testing (VAPT) after every deployment, as guided by the Department of Information and Communications (DICT).
- Booking Portal will be launched and be incorporated in the sample receiving process of the DOST member laboratories.

- Repository Management shall be created for better management of the EULIMS deployed to each implementing agency.
- Google studio dashboard be created for Top Management real-time monitoring of the laboratory operations

Objective 5: Establish linkages with government and non-government partners for resource generation and sharing to sustain laboratory operations

- Partnerships/collaborations will be forged with government and/or non-government stakeholders to establish resource sharing and develop means of utilizing fees collected.
- Policies on use of income shall be developed for implementation.

3. RESULTS AND DISCUSSION

3.1 The growing network of DOST OneLab

Taking a closer look at the primary objective behind the inception of the OneLab Network, it is because of the aspiration of pioneering an innovation in service delivery. This innovation aimed to virtually interconnect DOST's regional laboratories, research institute facilities, and diverse non-DOST laboratories both within and outside the nation. This interconnected network, while respecting the individual mandates and regulatory functions of each entity, was designed to offer a seamless gateway for easy access to testing and calibration services for various stakeholders.

As the project tries to continuously expand its network, as of 31 December 2024, it has now a total of 68 members in the network. Of this number, 16 comes from the regional laboratories of the DOST system, 7 from research and development institutes of the department, 1 from its scientific and technical service institute, 34 local non-DOST laboratories coming from both government and private institutions, and 10 international laboratories coming from other economies. The new members have brought in new and specialized services to the network. Figure 3 shows the distribution of the DOST OneLab network.

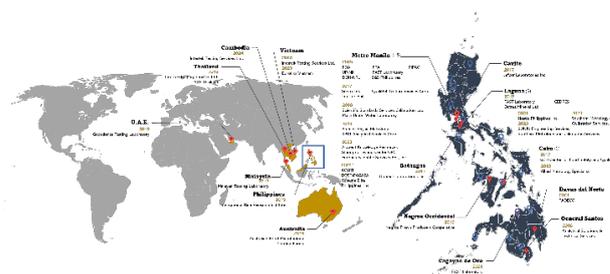


Figure 3. Member laboratories of the DOST OneLab Network from the Philippines and Other Economies

3.2 OneLab Referral System

The project's general objective is to sustain and elevate the services provided by DOST laboratories in support of MSMEs' transition to Industry 4.0, enabling them to become innovative and globally competitive. These services encompass high-quality laboratory testing and calibration, research and development, and training programs. But given the archipelagic nature of the Philippines, connecting stakeholders with laboratories is very much challenging. Thus, a robust referral system was established. Figure 4 shows how the referral system works. Customer will just need to go to the nearest laboratory in its area, and through an information technology (IT) platform, the receiving laboratory can determine which laboratory has the capability to cater the requested testing and/or calibration service, considering the unavailability of the service at their laboratory or at their locality.

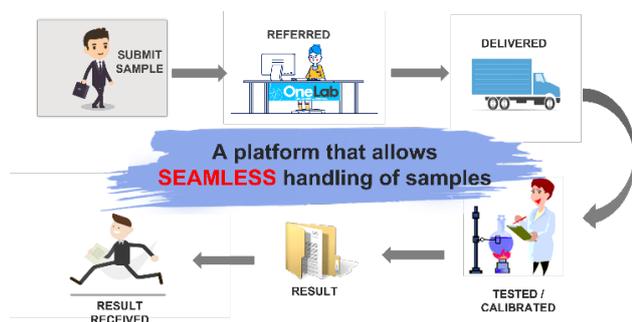


Figure 4. Referral System of the DOST OneLab Network

Figure 5 shows the availability of DOST laboratories throughout the whole of the Philippines to receive samples for testing and calibration and refer it to other member laboratories in the network, whether it be coming from the DOST system, other government agencies, and from the private sectors.

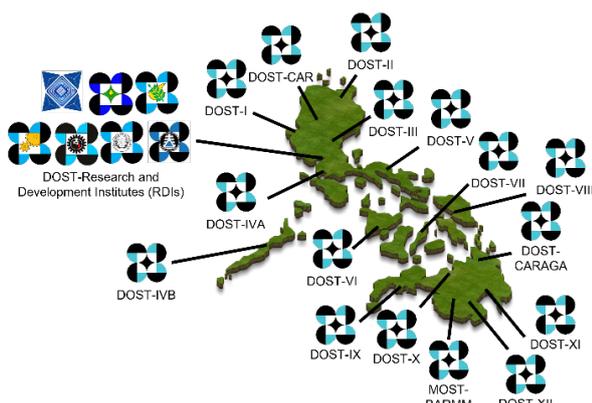


Figure 5. DOST Laboratories in the whole of the Philippines

3.3 Benefits of DOST OneLab to its Member Laboratories

OneLab provides relevant and efficient laboratory services for industries, research institutions, other government & non-government sectors, and the general public. It offers wider scope of services for different materials

and products. It is being implemented with the following mission and vision:

Mission

“To provide global access to comprehensive analytical and calibration services at a single touch point”

Vision

“By 2030, smarter OneLab is a network of globally-renowned laboratories distinguished for quality, proficiency, and reliability in the provision of testing, calibration, R&D, and training services”

It provides the following benefits for its member laboratories:

1. Gain new customers, even those coming from far locations of the country;
2. Free advertisements of their various services;
3. Gain opportunities to benchmark best practices for their own continual improvements;
4. Networking and learning from other member laboratories which help them improve competence and identify corrective actions to nonconformities;
5. Allows laboratories to enhance their methods and technical competence through various capability building activities being organized by DOST OneLab; and
6. Secure glimpse of the business environment needs.

3.4 OneLab IT Infrastructure

The DOST OneLab is a network of testing and calibration laboratories aimed at ensuring availability and broadening public access to testing and calibration services at a single touchpoint through an IT-based platform. OneLab uniquely facilitates the seamless laboratory transaction from sample receipt to release of test and calibration results as facilitated by the OneLab Referral System. With this efficient system, customers and stakeholders get the fastest turn-around time and expanded test and calibration offerings in the market. Figure 6 shows the components of the DOST OneLab information technology components.

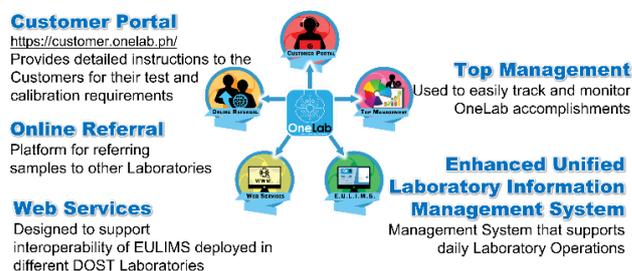


Figure 6. OneLab IT Infrastructure

3.5 Other OneLab Innovations

It is to emphasize that the 3-year project for brevity, is called OneLab for TED. TED stands for testing and

calibration, education and discovery. This education component aims to provide assistance on provision of trainings and engagements where the DOST and other resource persons share expertise in their fields to different stakeholders. Emphasizing on the training assistance that OneLab provides and facilitates, are those granted with Continuing Professional Development (CPD) units. These are important to ensure that the knowledge and skills of laboratory personnel in their respective fields are continuously updated and improved to better serve our customers. Expanding further this goal, the initiative makes these trainings accessible and open to the public.

Most of OneLab’s research and development initiatives are based on the identified industries in the respective regions in the Philippines. It is evident from that the overarching aim of the DOST testing and calibration laboratories is not limited to merely delivering routine lab services. Instead, its focus is firmly directed toward aiding our stakeholders in enhancing their services and products for the betterment of the society.

3.6 OneLab Initiative Awards and Recognitions

The initiative aims to upgrade its services to sustain the delivery of analytical testing and calibration services; serve as a research and development and innovation hub; and become training providers to different stakeholders. This is expected to meet the current demands of MSMEs, local government units, state universities and colleges, and other stakeholders. Due to the archipelagic nature of the Philippines, the DOST one-stop shop laboratory services (OneLab) has created a strong network of its testing and calibration laboratories in the whole country, both coming from the government and private sectors, which collaborate to meet the needs of various stakeholders, ensuring the quality and safety of raw materials and products. It has even extended its network by having member laboratories from nearby countries, making technical services available and relevant to current needs and emerging concerns. This is a clear statement of the trust of international laboratories in the strong foundation and commendable innovation in government service delivery of DOST OneLab.

A robust referral system, which is anchored on an information technology (IT) platform, was established and made stronger. It has helped connect in a single touch point the stakeholders to the appropriate testing and calibration laboratories which can cater their laboratory requirements.

The expansion of OneLab’s services is realized and continuously being done through upgrading and provision of new facilities, infrastructures, equipment, and forging of linkages. It has ensured that member laboratories established and maintained laboratory quality management systems based on ISO/IEC 17025:2017, an international standard used in the laboratory accreditation of competent and internationally-recognized testing and calibration laboratories. Collaborations are enhanced in the project implementation because of the devolvement and decentralization of certain services. This involves weaning out common analytical tests and calibration services whilst gradually focusing on unique ones that the member laboratories provide.

As part of this initiative, the project team regularly conducts planning workshops participated by project coordinators and leaders in the DOST system to revisit OneLab’s roadmap, followed by updating of the strategic objectives and key performance indicators based on a predetermined project framework. It is divided into components necessary for the sustained operation of the network alongside its continuous advancement and continual improvements.

With the growing economy of the Philippines as the next big thing in Asia, various concerns emerge and DOST OneLab provides new, unique and/or enhanced testing, calibration and other technical services which benefit the stakeholders with complex requirements, helping them become globally competitive.

OneLab is an avenue of the DOST member laboratories to support the stakeholders, especially the MSMEs amidst the growing and developing Philippine economy. The [fast-paced] development requires strong support to ensure that a healthy market competition exists and that it is geared towards business sustainability, employment generation, and wealth protection. Figure 7 shows the various awards and recognitions of DOST OneLab.



Figure 7. DOST OneLab Awards and Recognitions through the Years

GovMedia Magazine, the premier source of news and information dedicated to governance and leadership worldwide, has announced 60 winners of the 2024 GovMedia Awards, which were held on June 13, 2024, at the Marina Bay Sands Expo and Convention Center, Bayfront, Singapore.

The DOST OneLab project was cited as the sole Governance Project of the Year winner in the science and Technology sector. Nine other projects by Philippine national government agencies and three local companies won in different categories.

GovMedia Magazine is part of the Charlton Media Group (CMG), headed by Tim Charlton as CEO. CMG is a leading business-to-business publisher based in Singapore that publishes titles such as the Singapore Business Review, Hong Kong Business, Asia-Pacific Broadcasting+, and Asian Telecom.

GovMedia Magazine describes the GovMedia Conference and Awards 2024 as the peak of awards events "... where innovation meets recognition," adding that it cites outstanding government projects and initiatives in the Asia Pacific. It highlights trends and best practices transforming the public sector and showcases contributions shaping the Asia Pacific region's development.

Guillaume Sachet of KPMG International Ltd., a judge at the awards programme, said, "... the government sector is crucial in shaping the growth and direction of the country and region. Impactful government projects ... can change the future of generations."

Rosemarie S. Salazar, DOST OneLab Project Leader and Chief Administrative Officer of DOST IX, when asked during the GovMedia Conference, listed "... improvement of MSMEs' operations to enable them to mechanize and use digital instrumentation as our end goal."

She added that these offerings help MSMEs meet market demands, comply with trade regulations, and stay ahead of the competition, thus ensuring business continuity and growth.

On behalf of the OneLab project management office (PMO), Salazar and DOST OneLab Project Coordinator Admer Rey C. Dablio received the plaque of recognition. Both participated in the conference's panel discussion on "Harnessing Technology for Government Innovation: Case Studies in Digital Transformation," with Simon Hyett, Contributing Editor of Gov Media, as moderator.

4. CONCLUSIONS

Borne by the desire to provide an excellent customer-focused service, the project entitled, "Smarter OneLab for Industry 4.0 through Testing and Calibration, Education, and Discovery (OneLab for TED)" is continuously delivering its mission of providing global access to comprehensive analytical and calibration services. OneLab has made the laboratory tests and calibration services closer to Filipino people through its 68 member laboratories to date. The project will continually respond to the necessity of interconnecting different stakeholders seeking testing and calibration services, a challenge imposed by the geographical complexity of the Philippines.

ACKNOWLEDGMENTS

This paper would like to express gratitude for the project team of the OneLab for TED Project funded by the Grants-in-Aid (GIA) program of the Department of Science and Technology (DOST) in the Philippines. The project team would also like to acknowledge the DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD) serving as the project's monitoring agency.

FUNDING STATEMENT

This project is funded by the Department of Science and Technology through the Grant-in Aids Program. The project, entitled "Smarter OneLab for Industry 4.0 through Testing and Calibration, Education, and Discovery (OneLab for TED)," being implemented from 2023 to 2025.

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