Republic of the Philippines

DEPARTMENT OF SCIENCE AND TECHNOLOGY

ADVANCED SCIENCE AND TECHNOLOGY INSTITUTE

2024 Annual Report

CONTENTS

6 MESSAGES

13 FLAGSHIP EVENT

13 DOST-ASTI launches the first-ever ASTICON
ASTICON 2024: Together, We Can Drive Technological Innovation

15 STRATEGIC PROGRAMS

AI-CENTERED COMPUTATION, OPTIMIZATION, AND RESPONSIBLE RESEARCH DEVELOPMENT (ACCORD)

ADVANCEMENT OF AUTONOMOUS SYSTEMS, WIRELESS CONNECTIVITY, AND EMBEDDED ELECTRONICS FOR NATIONAL TRANSFORMATION (ASCENT)

COLLABORATIVE OPEN NETWORK INFRASTRUCTURE FOR EMERGING TECHNOLOGIES, COMPUTING, AND CONNECTIVITY (CONNECT)

TRANSFORMING HIGH-IMPACT RESEARCH INTO VIABLE EVERYDAY SOLUTIONS (THRIVE)

16 RESEARCH AND DEVELOPMENT

ACCORD

16 GuI.AI Project
AI- and IoT-Assisted Small-scale Plant-growing System
17 Philippine Sky Artificial Intelligence Program (SkAI-Pinas): ASTI Automated Labeling Machine (ASTI-ALaM)
18 iTANONG: A Natural Language Interface to Databases for Filipinos
19 Intelligent Machine Condition Monitoring System for Limestone Grinding (MaSense)
20 AI-Powered Weather Forecasting for a Resilient Philippines (AI-4RP)
21 SAqFeeder: Smart Aquafarm Feeder and Monitoring System in Highly Turbid Conditions
21 Synthetic Aperture Radar and Automatic Identification System for Innovative Terrestrial Monitoring and Maritime Surveillance (SARwAIS) Project
23 Sugar Regulatory Administration-Web Analytics Platform (SRA-WAP) Project
23 Registration and Identification System for Everyone (RISE)

ASCENT

25 Resilient Education Information Infrastructure for the New Normal (REIINN)
26 Robot for Optimized and Autonomous Mission-Enhancement Responses (ROAMER)
Component 1: Robot for Optimized and Autonomous Mission-Enhancement Responses (ROAMER)
Component 2: Autonomous Societally Inspired Mission Oriented Vehicles (ASIMOV) - Harmonized Aerial Watch and Knowledge-based Survey (HAWKS)
27 Vehicle-to-Everything (V2X) Initiatives for Road Safety
28 Signal Assessment Using Geospatial Analysis Project (SAGAP) Phase II
29 Sustainability and Upgrade of the Existing Meteorological Buoy (Metbuoy+)
29 Design and Development of a Cost-Effective and Modular Autonomous System to Trace and Retrieve In-water Information via an Intelligently Driven Electric Rover (STRIIIDER)
30 Research Project - Tactical Reconnaissance for Operational Awareness (RP-TROPA)
31 Research and Capability-building in Autonomous and Unmanned Systems (AUS)

CONNECT

32 Leveraging Satellite Bus Development Best Practices and Platform on arQ (arQ 2.0 / Level-up)
32 Automated Electronic Survey System
33 Establishment of Quantum Innovation Laboratory: Optimizing a Decision Diagram-based Free and Open-Source Quantum Circuit Simulator for Benchmarking in an HPC Environment using Entanglement, Random Circuits, and Quantum Algorithms Benchmark Datasets (QCS)
34 DataProtect: Protecting Data Using Blockchain Technology - Self-Sovereign Identity Empowerment: Reinventing Rights and Attributes (DataProtect-SIERRA)
35 Characterizing Schemes for Encoding First-Order Statistical Features and Textures Features in RGB Images into Quantum Data for Quantum Image Processing (QIP)
35 Computing and Archiving Research Environment (COARE)
37 HR Lite
38 Design and Development of a Secure Entry with Keyless User Access Proof-of Concept Prototype for DOST-ASTI (SEKyU)
38 Aksyon: A Service Management Solution for a More Responsive Government
39 eDecide: an Electronic DECision-making Tool powered by a Data Analysis Environment
40 Full Automation and Streamlining Tool for Efficient and Reliable Public Service (ProcessFASTER)
41 Automated Workflow for Research and Development Information System (AW4RDIS)

THRIVE

43 IP Management Program for Academic Institutions Commercializing Technologies - Strengthening Intellectual Property Management for Upgraded Licensing and Adoption mechanisms of ASTI technologies for commercialization (IMPACT-SIMULA)
44 Electronics Product Inclusive Innovation Center (EPIIC) Garage
45 Information Network for Open and Viable Applications and Technology Exchange (InNOVATE)
46 Sustainability of ASTI-Developed Technologies for Meteorological Data Acquisition Stations for Information Dissemination (SADT-MASID)
46 Forecasting the Weather Using Lightning Observations as Safeguard for Hazards (FLASH)

48 TECHNOLOGY TRANSFER
48 Technology Transfer Synergy Group
48 Business Development Unit
49 Corporate Communications Unit
50 Technology Licensing Office
54 KNOWLEDGE MANAGEMENT SUPPORT SERVICES
56 HUMAN RESOURCE DEVELOPMENT
60 FINANCIAL PERFORMANCE
62 PHYSICAL PERFORMANCE
63 ORGANIZATIONAL STRUCTURE
65 DIRECTORY
65 Key Officials
65 Contact
66 PUBLICATION STAFF

Vision

To be a world-class leader in emerging technologies, and research and innovation.

Mission

To drive research and innovation by developing relevant technology-driven solutions with far-reaching benefits to society.

Our Strategic Goals

Advanced S&T knowledge for greater benefit to society increased.

Sound fiscal management achieved.

Top-notch organization derived from improved HR processes established.

Internal processes for better services optimized.

Messages

Secretary's Message

As we reflect on the accomplishments of the Department of Science and Technology – Advanced Science and Technology Institute (DOST-ASTI) this year, I extend my deepest gratitude to everyone who worked tirelessly in the pursuit of scientific and technological excellence. Your dedication and expertise are vital in propelling our nation forward, particularly in the fields of microelectronics, information and communications technology (ICT), and other emerging technologies.

The work you have done this year is the very embodiment of the 2024 theme: **Together, We Can.**

The DOST-ASTI team has demonstrated once again that through perseverance in partnerships, stakeholders' engagement, camaraderie, and collective effort, we can achieve progress beyond our goals and aspirations – not only for the agency but for the whole DOST.

I want to give particular emphasis to the SARwAIS Project that stood as a testament to the power of innovation and collaboration in maximizing the potential of space technology. What began as a focused initiative in security and surveillance has evolved into a far-reaching endeavor supporting Disaster Risk Reduction and Management (DRRM), forest mapping,

aquaculture monitoring, and object identification through advanced Earth observation data. This expansion allowed us to engage and train hundreds of individuals from academic institutions, research centers, and government agencies across the country, empowering them to harness space technology for national development.

The success of SARwAIS is a shining example of what we can achieve through collaborative innovation. By promoting an ecosystem of knowledge-sharing and resource optimization, we are not only advancing research and technology but also helping communities make informed science-based decisions. More than just a scientific achievement, SARwAIS represents the broader mission of DOST—**to make cutting-edge research and technological advancements accessible and impactful for all Filipinos.**

This feat is made possible through the government's steadfast investment in science, technology, and innovation. DOST has allocated significant resources to space programs, recognizing their extensive potential in shaping the future of our nation. Space data has become an essential asset for monitoring, managing, and securing our natural and economic resources.

It is a source of great pride that the Philippines' journey into space science and technology began right here at DOST, under the guidance and expertise of DOST-ASTI. The dedication and ingenuity of our researchers and scientists have placed our country on the global map, unlocking new opportunities for what we can achieve through knowledge-sharing and international cooperation.

Your contributions to cutting-edge research, innovation, and technology development continue to strengthen our global standing in science and technology. This year also marked a significant milestone with the successful launch of the Advanced Science, Technology, and Innovation Convention (ASTICON).

As we continue this journey, let us remain committed to leveraging science and technology for a more resilient, progressive, and innovation-driven Philippines. Through DOST-ASTI, together with our partners and stakeholders, we are redefining the landscape of R&D in the country—be it connectivity, Artificial Intelligence, blockchain, quantum computing, robotics, technology transfer activities, and more.

Together, let us continue to champion science and technology as key drivers of inclusive and sustainable development.

RENATO U. SOLIDUM, JR., PH.D.
Secretary
Department of Science and Technology

Undersecretary's Message

The Advanced Science and Technology Institute of the Department of Science and Technology (DOST-ASTI) has long been a driving force in pioneering research and development in emerging technologies. This annual report is a testament to the Institute's commitment towards innovation and its vital role in shaping the country's scientific and technological landscape.

In 2024, DOST-ASTI successfully completed 13 groundbreaking projects and remained actively engaged in 19 R&D initiatives that address critical challenges across various priority sectors. These initiatives exemplify the Institute's proactive approach to high-value research, ensuring that scientific advancements are not only innovative, but also practical and relevant. From artificial intelligence and robotics to blockchain, and pioneering quantum computing, IPv6, and V2X technologies, DOST-ASTI remains at the forefront of transforming emerging technologies into real-world applications in the realm of connectivity and smart automation.

Beyond these advancements, the Institute continues to strengthen the country's research ecosystem by modernizing infrastructure, developing digital platforms, and fostering knowledge-sharing among partners. By establishing strong synergies with national and international collaborators, DOST-ASTI amplified the reach and impact of its work, reinforcing the role of

science, technology, and innovation as pillars of national progress.

The SARwAIS Project, for one, marked its successful completion of six years of dedicated efforts aimed at enhancing the country's capabilities in terrestrial monitoring and maritime surveillance. Through the Department's works and efforts in International Cooperation, we have successfully fostered a strong bilateral relationship between the United Kingdom and the Philippines. Through strategic partnerships, such as those established for the SARwAIS Project, we have witnessed fruitful collaboration between nations, paving the way for groundbreaking achievements in space science and technology.

This year also marked a significant milestone in protecting the Institute's intellectual property. DOST-ASTI secured an invention patent for the *'Mechanical Stabilizing Means for Radio Antennas'*, a crucial component of the Communication Relay Buoys under the CoCoMoNets Project. Additionally, the Institute received a utility model for the RuralSync®, a prescursor of Project REIIINN.

Looking ahead, I am confident that DOST-ASTI will continue to make even greater strides as a key player in major DOST initiatives, including the GATES Hub and the newly launched PROPEL program—both programs demonstrate the critical role of robust research and development in geospatial technologies and technology transfer and commercialization, respectively. Through these programs, we aim to promote an environment that nurtures innovation, fosters collaboration, and strengthens the country's position in the rapidly evolving digital economy.

I extend my deepest appreciation to the dedicated researchers, engineers and innovators at DOST-ASTI who continue to embody our culture of excellence in continuing to drive the Institute's success. Your passion, expertise, and commitment fuel the Institute's mission to push the boundaries of what is possible, a mission aligned to your agency's goals.

DOST-ASTI's resilience lies in its ability to harness expertise, leverage robust infrastructure, and cultivate strategic partnerships to drive progress and innovation in Science R&D. Through these strengths, we enable a future where science, technology, discovery, and development are accessible, transformative, and integral to national development.

As we forge ahead, let us keep moving beyond possibilities, shaping a future driven by scientific excellence and groundbreaking innovation in microelectronics, ICT, and beyond.

LEAH J. BUENDIA, PH.D.
Undersecretary for Research and Development
Department of Science and Technology

Director's Message

2024's theme was *"Together, We Can,"* and **DOST-ASTI indeed delivered**.

This year, we embarked on groundbreaking initiatives, fostered meaningful collaborations, and successfully organized the **first-ever Advanced Science, Technology and Innovation Convention (ASTICON)**—a pioneering event that showcased the immense potential of Philippine science and technology. ASTICON brought together researchers, industry leaders, and policymakers to exchange ideas and drive innovation. The ASTICON strategically centers its focus on highlighting the forefront of emerging research and technology services and projects pioneered by DOST-ASTI. Within this framework, we place a spotlight on several key areas of interest-- including artificial intelligence, robotics, space technology, the Internet of Things, and smart technologies, among others.

I extend my heartfelt gratitude to the dedicated organizers who worked tirelessly to make this landmark event a resounding success. Your hard work and commitment exemplify what it truly means to advance science and technology for national progress.

Beyond ASTICON, **DOST-ASTI celebrated the achievements of projects and services that concluded in 2024.** These initiatives have significantly contributed to the fields of microelectronics, information and communications technology (ICT), and other emerging technologies in that domain. The dedication of our teams to completing these projects with excellence was showcased in our year-end activity, where we honored their impact on research, innovation, and society.

We take immense pride in the following projects, each of which has played a significant role in strengthening the scientific and technological landscape of the country:

1) IMPACT-SIMULA – Established structured technology transfer processes, policies, and systems for IP management and technology commercialization.
2) AESS (Automated Electronic Survey System) – Revolutionized data collection by reducing the costs of traditional methods, ensuring a transparent and efficient framework for data processing and aggregation.
3) AUS Project (Autonomous and Unmanned Systems) – Designed an autonomous mobile disinfection robot to enhance sanitation efforts, inspired by the challenges of the COVID-19 pandemic.
4) iTANONG – Developed a natural language querying engine (NLQE) and conducted cutting-edge research to enhance data accessibility.
5) MaSense – Advanced machine predictive analytics and conducted research on machine condition monitoring to improve industrial efficiency.
6) HR Lite – Provided a government-configured HR management system that ensured productivity, convenience, and efficiency in HR operations.
7) EPIIC Garage – Strengthened the Electronics Product Development Center (EPDC) as a hub for electronics design and innovation.
8) SARwAIS – Utilized Synthetic Aperture Radar (SAR) and Automatic Identification System (AIS) data from NovaSAR-1 to enhance maritime domain awareness, disaster response, and resource mapping.
9) REIINN Phase 2 – Bridged the digital divide through resilient educational infrastructure for remote learning.
10) SAGAP Phase 2 – Improved RF signal propagation simulations to help strategically place telecommunications, TV, and radio transmitters.
11) SRA-WAP – Collaborated with the Sugar Regulatory Administration (SRA) to develop a GIS web portal for visualizing sugar yield maps.

These projects are testaments to the brilliance and dedication of our scientists, engineers, researchers, and project leaders.

Beyond these projects that concluded in 2024, **DOST-ASTI continues to forge ahead, managing 35 active projects and services,** all of which are highlighted in this Annual Report. Through these initiatives, we hope you gain a deeper appreciation of our unwavering commitment to advancing science and technology for the benefit of the Filipino people.

This year, we also introduced our **key DOST-ASTI programs — Collaborative Open Network iNfrastructure for Emerging Technologies, Computing, and ConnecTivity (CONNECT), Advancement of Autonomous Systems, wireless Connectivity, and Embedded Electronics for National Transformation (ASCENT), AI-Centered Computation, Optimization, and Responsible Research Development (ACCORD), and Transforming High-Impact Research Into Viable Everyday Solutions (THRIVE)**—a strategic move to streamline our projects and services into focused pillars that drive and promote innovation, collaboration, and technological progress. By organizing our initiatives under these key programs, we aim to enhance efficiency, maximize impact, and ensure that our scientific and technological advancements remain aligned with national development goals.

2024 was a promising year for DOST-ASTI—and may we continue to thrive, innovate, and break new ground in the years ahead.

My all-out appreciation goes to every single employee of DOST-ASTI – from administrative staff, project managers, project leaders, Division Chiefs, researchers, scientists, and even our security guards and facilities maintenance workers – together, we indeed can.

Together, we can transform our nation's technological landscape.

Together, we can drive forward the frontiers of science and innovation.

Together, we can inspire the next generation of scientists and researchers.

Together, we can harness the power of technology for sustainable development and national progress.

It's endless, but together—we can achieve scientific feats and breakthroughs outside of what we can only imagine.

Again, together, let us reflect on our achievements and inspire one another to continue our pursuit of excellence—not only in 2024 but for many years to come. DOST-ASTI will remain steadfast in promoting science and technology innovation, and together, let us turn this vision into more realities in 2025.

FRANZ A. DE LEON, PH.D.
Director
DOST-Advanced Science and Technology Institute

Flagship Event

DOST-ASTI launches the first-ever ASTICON

ASTICON 2024: Together, We Can Drive Technological Innovation

DOST-ASTI is setting a new benchmark in scientific collaboration and technological innovation with the launch of the Advanced Science and Technology Innovation Convention (ASTICON) this 2024. With the theme ***"Together, We Can,"*** this pioneering event highlights the agency's commitment to fostering camaraderie and cooperation among stakeholders to advance emerging technologies in the country.

ASTICON, at its core, is designed to increase public awareness of DOST-ASTI's extensive capabilities, represented by its innovative products and services in emerging technologies. By providing a platform for interaction, the event – geared to be organized annually – aims to showcase DOST-ASTI's pioneering contributions as thought leaders into the ICT and microelectronic landscape.

In partnership with the University of the Philippines, through its Electrical and Electronics Engineering Institute (UP EEEI), DOST-ASTI aims to create a premier platform where experts, researchers, industry leaders, and policymakers can converge to exchange ideas, explore new frontiers in research, and forge collaborative opportunities. ASTICON distinguishes itself from other promotional events by serving as the flagship venue for showcasing the agency's latest breakthroughs in its research and development initiatives in the field of Information and Communications Technology (ICT) and microelectronics.

Spanning two days (18-19 July 2024), ASTICON 2024 featured a diverse range of cutting-edge projects and services from both DOST-ASTI and UP, highlighting transformative advancements in Artificial Intelligence, Robotics, Space Technology, Internet-of-Things, and Smart Technologies. These fields represent the future of digital and technological progress, and ASTICON seeks to bridge gaps between research and real-world applications through insightful discussions and demonstrations.

The event also hosted themed sessions with research presentations focusing on crucial areas such as:

- Energy: Exploring sustainable solutions and advancements in power systems and renewable energy technologies.
- Environment Monitoring and Disaster Risk Reduction and Management (DRRM): Showcasing technologies designed to protect natural resources and enhance disaster resilience.
- Smart Cities: Highlighting intelligent systems and innovations that drive urban development and efficiency.
- Health: Presenting new medical and digital health technologies that aim to improve healthcare access and patient outcomes.
- Emerging Technologies: Delving into disruptive innovations that are shaping the future of various industries.

By bringing together representatives from the private sector, local government units (LGUs), academia, and national government agencies (NGAs), ASTICON 2024 indeed cultivated a vibrant ecosystem where knowledge-sharing and collaboration flourish.

The convention serves as a testament to the agency's mission of pushing the boundaries of science and technology to drive national development, and we hope that we will be able to commit to this mission for many years to come.

With ASTICON 2024, DOST-ASTI reaffirms its role as a key player in the country's digital transformation. As the theme suggests, ***"Together, We Can"*** achieves groundbreaking progress, leveraging collective expertise and shared vision to propel the nation towards a more technologically advanced and sustainable future.

We thank everyone who supported this initiative.

Strategic Programs

AI-Centered Computation, Optimization, and Responsible Research Development (ACCORD)

The ACCORD program promises to be a driving force in harnessing the power of artificial intelligence for the Philippines. By championing responsible research, developing AI solutions that directly address national priorities, and investing in workforce development, ACCORD strengthens the country's position in the global AI landscape.

The program builds on the foundation of DOST-ASTI initiatives and aligns with the national AI strategy, focusing on inclusive innovation, robust governance, and industry collaboration. With its comprehensive approach – spanning infrastructure, skills, policy, and deployment – ACCORD not only addresses critical needs but also fosters partnerships across sectors. This positions the Philippines to lead in AI-driven growth and innovation, ensuring that technological progress translates into compelling opportunities for communities and the economy towards the exciting age of Artificial Intelligence.

Advancement of Autonomous Systems, Wireless Connectivity, and Embedded Electronics for National Transformation (ASCENT)

ASCENT is DOST-ASTI's definitive program for state-of-the-art autonomous systems, IoTs and wireless communication. It shall deliver holistic solutions that include, as appropriate, the requisite hardware, software subsystems, communication gateways, infrastructure for data aggregation and visualization, security, AI and data analytics platform, training, and technical support.

The solutions developed under ASCENT are designed to reach at least Technology Readiness Level 7, indicating that they have been validated as functional prototypes within relevant operational environments. These solutions are intentionally crafted with a user-centric approach to deliver an enhanced and seamless customer experience.

Collaborative Open Network iNfrastructure for Emerging Technologies, Computing, and ConnecTivity (CONNECT)

Technological innovation and economic growth are interconnected and mutually reinforcing. The policies and investments of a nation in technological innovation – closely linked with robust research and development – drive the creation of new products, processes, and markets. This dynamic, in turn, plays a critical role in accelerating sustainable economic growth and enhancing national competitiveness.

The CONNECT Program further strengthens DOST-ASTI's mandate in establishing science and technology infrastructures that enable the achievement of SDG 9.5 goals to enhance scientific research, upgrade technological capabilities of industrial sectors, and encourage innovation by capacitating researchers.

Transforming High-Impact Research into Viable Everyday Solutions (THRIVE)

THRIVE is a program designed to bridge the gap between breakthrough research and real-world applications. THRIVE is founded on the belief that impactful research should not remain confined to academic journals or research institutions. Instead, it should be actively translated into products, services, and policies that address everyday challenges aligned with DOST-ASTI's mission.

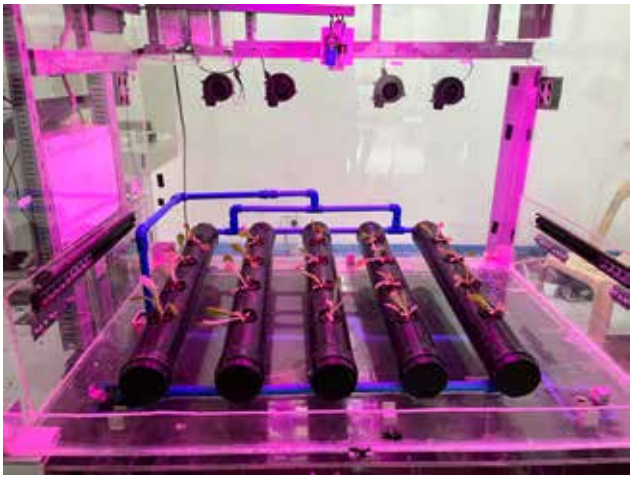
The program empowers and provides researchers and innovators with hands-on support, expert mentorship, and practical guidance to help turn their ideas into real-world solutions that make a tangible impact both in society and the marketplace.

Research and Development

ACCORD

Gul.AI Project

AI- and IoT-Assisted Small-scale Plant-growing System



Project Duration

01 January 2023 to 31 December 2025, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The Gul.AI Project aims to develop a small-scale plant-growing system for conducting research experiments on small crops. The system showcases the application of the following technologies to plant-growing:

Internet of Things (IoT) for data gathering through remote and automated operation of the system; and Artificial Intelligence (AI) and statistical analytical methods to the analysis of multivariate datasets gathered by the system.

Through experiments using the system, researchers will be able to identify ideal plant-growing conditions for specific variants of small crops.

2024 Accomplishments

The AI training program included a three-day session at University of Rizal System (URS) Tanay Campus and a two-day session at URS Morong Campus that introduced students and faculty to AI, machine learning, and deep learning, equipping them with foundational knowledge on AI applications in agriculture. The team also conducted an End-User Training at URS Tanay, where faculty and students were given hands-on experience in operating and navigating the Gul.ai system.

These training sessions provided participants with practical insights, ensuring they were well-prepared to integrate and utilize the technology effectively.

Partners and Stakeholders

The Gul.ai Project strengthened its partnership with URS Tanay campus to further validate the Gul.ai system and to support their research activities with the help of AI.

Philippine Sky Artificial Intelligence Program (SkAI-Pinas): ASTI Automated Labeling Machine (ASTI-ALaM)

Project Duration

01 October 2021 to 30 September 2024, Ongoing/ Extended

Funding Source

DOST-PCIEERD Grants-in-Aid

Project Summary

In a bid to address the Philippines' growing need for accessible Artificial Intelligence solutions, the Philippine Sky Artificial Intelligence (SkAI-Pinas) Program aims to bridge the gap between cutting-edge research and real-world applications. Despite global AI advancements, local institutions face challenges in infrastructure, expertise, and costs, limiting full adoption.

2024 Accomplishments

The Program continued to advance its mission of democratizing AI through the ASTI-Automated Labeling Machine (ASTI-ALaM) and ALaM-Large Scale Initiative (ALaM-LSI).

- ASTI-ALaM delivered a beta release of the Decentralized Intelligent Model Exchange Repository (DIMER), enabling cost-effective model contribution, management, and deployment.
- Through ALaM-LSI, the program built AI-enhanced workflows for large-scale data processing, accelerating remote sensing and geospatial applications.

DOST-ASTI AI experts also shared insights at international conferences, fostering knowledge exchange among students, researchers, agencies, and industry.

Partners and Stakeholders

ASTI-ALaM developed and optimized AI models for disaster risk reduction, environmental monitoring, agriculture, traffic management, and logistics. Collaborations with the following agencies fueled the program's solution refinement initiatives:

1) DOST-PHIVOLCS.
2) PhilRice-Philippine Rice Information System (PRiSM).
3) Sugar Regulatory Administration.
4) Metropolitan Manila Development Authority (MMDA).
5) Technological University of the Philippines-Visayas.
6) University of the Philippines Los Baños Museum of Natural History.

Bolstered by new Memoranda of Understanding with UPLB and DOST-PHIVOLCS, technical consultations, and broad public engagement, DOST-ASTI remains committed to promoting AI readiness and ensuring breakthroughs directly benefit communities.

The project garnered accolades, including the 2024 DOST Intellectual Property Awards and a Silver Award at the R10 HTC Innovation Challenge.

Moving forward, DOST-ASTI aims to strengthen cross-sectoral ties, accelerating responsible, inclusive AI adoption nationwide and driving an innovative, impactful AI ecosystem.

iTANONG: A Natural Language Interface to Databases for Filipinos

Project Duration

01 January 2022 to 31 December 2024, Completed

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The iTANONG Project is an AI-powered web application designed to answer queries in Tagalog, English, or Taglish using organization-maintained relational databases and uploaded documents.

2024 Accomplishments

The Project team conducted exploratory meetings with the DOST, the Congressional Policy and Budget Research Department - House of Representatives (CPBRD-HRep), and AI Singapore. Strategic collaborations were established – including partnerships with STARBOOKS (DOST-STII) and OneQuantum Philippines – formalized through a Memorandum of Understanding as well as Memorandum of Agreement during ASTICon.

To enhance skills development, iTANONG, together with the QCS Project and OneQuantum PH, organized a Quantum Natural Language Processing (NLP) Lecture Series and Hackathon Culmination for students at the University of the Philippines, Tacloban. To increase adoption to the DOST-ASTI, an End-User Training was also conducted.

The Project published one paper in Association of Computational Linguistics (ACL) Anthology and presented another paper at the 11th International Conference on Artificial Intelligence in Dubai, UAE. In addition to the recognition, the Project received accolades from the DOST Intellectual Property Awards for three research papers on text-to-SQL semantic parsing and corpus curation published in the early years of the project implementation.

These achievements highlight iTANONG's commitment to AI advancement and fostering collaborations for technological growth in government, academe, and the private sector.

Intelligent Machine Condition Monitoring System for Limestone Grinding (MaSense)

Project Duration

01 January 2024 to 31 December 2024, Completed

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The MaSense Project aimed to initiate a collaborative R&D with JGB Builders & Construction Supplies. The technology developed can extend to many sectors such as the National Power Corporation (NPC) in monitoring their huge and expensive hydropower generators.

The project also contributed to refining AI models for intelligent machine condition monitoring, a pivotal step towards advancing and deploying edge technologies for our local companies in the upcoming years.

2024 Accomplishments

The Project engaged in several key activities in 2024 including:

- Signed research agreements with:
  - JGB Builders & Construction Supplies, Inc.
  - Dr. Nathan Ray Alim, Assistant Director of DOST Region XI.
- Signed a Memorandum of Understanding with University of San Carlos (USC) for academic collaboration.
- Conducted data collection activities and field visits in areas of interest.
- Conducted training and capacity building activities on the following topics:
  - Training on Generative AI for LGUs and MSMEs in Tandag and Bislig City, Surigao del Sur.
  - Machine Condition Monitoring at the University of San Carlos in Talamban, Cebu.
- Published four (4) research papers, two (2) of which are awarded:
  - Best Paper Award at IEEE 2024 International Conference on Diagnostics in Electrical Engineering (Diagnostika) in Plzen, Czech Republic for the paper *"Deep Learning-based Machine Condition Diagnosis using Short-time Fourier*

Transformation Variants"

- Best Paper Award at IEEE 13th International Conference on Engineering Education (ICEED2024) in Kanazawa, Japan for the paper ***"Strengthening Artificial Intelligence-On-Edge Education in the Philippines: A Teacher-Centric Curriculum Development Strategy"***

AI-Powered Weather Forecasting for a Resilient Philippines (AI-4RP)

Project Duration

01 April 2024 to 31 March 2026, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The AI-4RP Project aims to develop and deploy a high-resolution and accurate weather forecasting model for the Philippines using atmospheric science technologies. This project is a collaborative effort between DOST-PAGASA and DOST-ASTI.

A key component of the project is a contract agreement between DOST-ASTI and Atmo Inc. for an annual software subscription that powers the AI-4RP Project with advanced AI and deep learning-based weather forecasting system.

2024 Accomplishments

Atmo's AI model, which is accessible to the public, delivers high-resolution forecasts for up to two (2) weeks and provides weather updates every 15 minutes – a significant increase from the previous three-hour prediction cycle. The initial deployment (Version 1 of the AI model) featured short-range and medium-range AI weather forecasting using deep learning neural networks, which was expanded in Version 2 to cover the entire Philippines.

The team from DOST-PAGASA also evaluates the AI weather forecasting model through specialized verification procedures and quarterly performance reviews, as well as model performance comparison against numerical weather prediction (NWP) models. The AI model's forecasts are also incorporated into daily discussions for Impact Based Forecasting (IBF) in Metro Cebu and Manila, while operational forecasters are surveyed to assess the model's accuracy and consistency, ensuring its reliability for practical applications.

In terms of capacity building, a training-workshop series was conducted for DOST-ASTI and DOST-PAGASA staff, which focuses on deep learning and transformers to equip the project team with Atmo Inc.'s innovative AI technology.

SAqFeeder: Smart Aquafarm Feeder and Monitoring System in Highly Turbid Conditions

Project Duration

01 October 2024 to 31 December 2026, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

SAqFeeder enhances aquafarm monitoring in turbid conditions by addressing challenges such as scattering, absorption, large particles, and artificial lighting. It improves feed quantity assessment, ensuring better farm management and economic sustainability for farmers.

The Project aims to optimize the feeding process by developing an intelligent feeding system using computer vision, auditory filtering, and automated actuation to overcome these challenges.

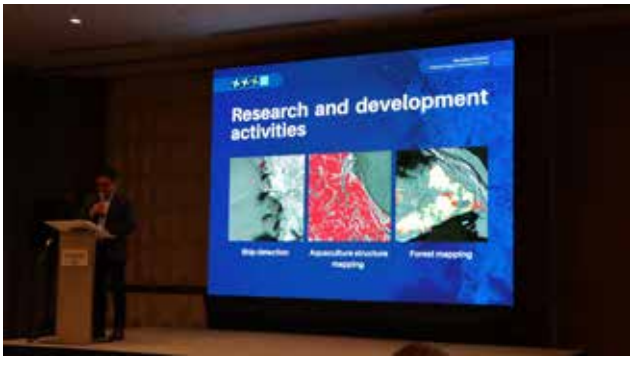
2024 Accomplishments

The project team engaged in several key activities in 2024 including:

- The first project meeting with the ASEAN Institutes on the ASEAN IVO Grant of Project SAqFeeder held at Bacolod City, Negros Occidental.
- Signing of a Collaborative Research and Development Agreement (CRDA) on the last day of the meeting together with TUP Visayas, Universiti Teknologi Brunei and Malaysia.
- Presentation of the report at the ASEAN IVO Forum in Cambodia last 06-07 November 2024.

The beneficiaries of the project are MARMI Agricultural Corporations and other aquafarms, environmental agencies, research institutions and local communities.

Synthetic Aperture Radar and Automatic Identification System for Innovative Terrestrial Monitoring and Maritime Surveillance (SARwAIS) Project



Project Duration

15 June 2018 to 15 August 2024, Completed

Funding Source

DOST-PCIEERD Grants-in-Aid

Project Summary

The SARwAIS Project utilized radar imagery and automatic identification system data from the NovaSAR-1 satellite to strengthen the country's response to disasters and monitor vital natural resources. The project distributed Synthetic Aperture

Radar and AIS data to concerned government agencies and academic institutions to augment their need for spaceborne data for terrestrial monitoring, disaster management, land cover classification, and environmental and agricultural monitoring.

2024 Accomplishments

The SARwAIS Project Culmination Activity on 17 May 2024 marked the successful completion of six years of dedicated efforts aimed at enhancing the country's capabilities in terrestrial monitoring and maritime surveillance. The event highlighted the publication of the Boundless Horizons, a book showcasing the space odyssey of the Philippines, as well as presentation of key milestones and accomplishments attained during the implementation of the SARwAIS Project.

In the event, the team also acknowledged the invaluable contributions of key stakeholders and partners in the project's success, especially in the utilization of Novasar-1 data.

The SARwAIS Project utilized NovaSAR-1 data for:

- Forest mapping
- Ship detection
- Ocean wake detection, and
- Flood impact assessment

It supports maritime security, pollution monitoring, disaster response, and land use monitoring.

In its six years of implementation, the team members were able to:

- Publish six (6) peer-reviewed journals.
- Present the project to national and international conferences.
- Conduct more than 40 training series and webinars for government agencies and academic institutions to enhance remote sensing expertise around the Philippines.
- Deployed three corner reflectors in UP Diliman, Bulacan State University and International Rice Research institute. These corner reflectors are used for calibration of the NovaSAR-1 satellite.

Partners and Stakeholders

The SARwAIS Project was co-implemented by the National Security Council and the Philippine Space Agency, with stakeholders in disaster response, surveillance, and research. It partnered with numerous state universities, private institutions, and government agencies for research and data-sharing, including the Philippine Statistics Authority, Philippine Coast Guard, National Coast Watch Council, among other agencies.

Sugar Regulatory Administration-Web Analytics Platform (SRA-WAP) Project

Project Duration

21 December 2022 to 31 December 2024, Completed

Funding Source

Sugar Regulatory Administration

Project Summary

The SRA-WAP Project developed a web portal for the Sugar Regulatory Administration to help their stakeholders visualize and monitor the historical and latest sugarcane yield estimates of Mill Districts (MDs). This platform will also serve as an additional tool in SRA's decision-making and crafting of policies with regards to the country's sugar production.

2024 Accomplishments

The DOST-ASTI successfully created a web portal for SRA to visualize generated historical sugarcane yield estimates derived from Sentinel-2 images, as well as other datasets that the SRA provided. The SRA-WAP Project team was able to successfully integrate the Python-based scripts into the portal's process workflow, as well as provide updates and improvements to these scripts for more efficient and automated processing of data and generation of desired outputs. The team was also able to train their counterparts in SRA, as well as write relevant documentation of the system's development and process workflow, thus ensuring its proper and smooth turnover to SRA.

Registration and Identification System for Everyone (RISE)

Project Duration

01 January 2024 to 31 December 2025, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

Project RISE is a comprehensive and reconfigurable registration and identification system aimed at enhancing accuracy, security, and accessibility. The project follows a phased development approach, integrating efficient data collection, secure management, and advanced identity authentication.

Designed for seamless integration with existing online platforms, RISE provides a flexible and reliable solution for organizations seeking modern registration and identity verification capabilities.

2024 Accomplishments

Partnerships were established with Quezon City LGU and one industry partner, while exploratory meetings were held with the National Bureau of Investigation, Philippine National Police, and Department of Migrant Workers.

Other notable technical advancements are:

- Formulation and development of various validation mechanisms that will be integrated into the registration unit to ensure secure and efficient identity verification.
- Development of a proof-of-concept disaggregated prototype of the registration unit was also initiated, laying the foundation for future scalable implementations.

The project also contributed to the development of young professionals, with one (1) student from De La Salle University, two (2) students from Catanduanes State University, and three (3) students from Philippine Science High School participating in the initiative.

ASCENT

Resilient Education Information Infrastructure for the New Normal (REIINN)

Project Duration

01 April 2022 to 31 December 2024, Completed

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The REIINN Phase 2 Project was established to bridge the digital divide in Geographically Isolated and Disadvantaged Areas (GIDAs), particularly during the pandemic. By leveraging innovative approaches to distance learning and connectivity, its two key components, LokalFi and RuralCasting, have significantly improved educational access while expanding their applications to disaster resilience and community information dissemination.

2024 Accomplishments

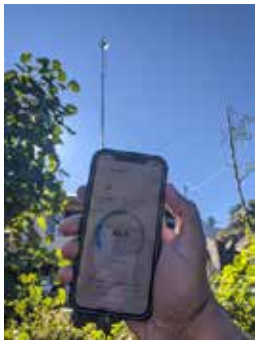
REIINN made developments in expanding its reach and improving digital access in underserved areas.

- In partnership with DOST-Metals Industry Research and Development Center (DOST-MIRDC), the team deployed a pneumatic antenna mast in Atok, Benguet, introducing a retractable and rapidly deployable network solution that enhances local connectivity.
- Collaborations with USAID-BEACON and help.NGO ensured continued network expansion in other pilot sites, further strengthening digital accessibility in remote communities.
- To support education, virtual field trips to the National Museum Galleries were added to REIINN's offline services, providing students in isolated areas with access to educational resources without requiring internet connectivity.

Beyond implementation, REIINN gained widespread recognition at major events such as National Science, Technology, and Innovation Week (NSTW), Regional Science, Technology, and Innovation Week (RSTW), and ASTICon 2024.

The project also received four SCOPUS-indexed publications at the 2024 DOST Intellectual Property Awards.

Collaborations with TESDA, the National Library, DOST agencies, USAID BEACON, and various LGUs ensured the project's sustainability and wider adoption, further strengthening digital inclusivity and community resilience across the Philippines.



Robot for Optimized and Autonomous Mission-Enhancement Responses (ROAMER)

Project Duration

15 June 2021 to 14 March 2025, Ongoing/Extended

Funding Source

DOST-PCIEERD Grants-in-Aid

Component 1: Robot for Optimized and Autonomous Mission-Enhancement Responses (ROAMER)

Project Summary

The ROAMER Project, under the ASIMOV Program, is developing a mobile robot that supports banana plantations in monitoring and detecting banana plant diseases by using data-driven decision making based on computer vision, sensing, and navigation, to ensure crop health and improving productivity. ROAMER also aids farmers in plant care and disease management by using a robot arm with precision spraying, reducing the exposure of humans to chemical hazards and use farm chemicals efficiently.

2024 Accomplishments

The ROAMER Project wrapped up its research and development activities in 2024, which were focused on the integration of its main components. The project's key accomplishments include:

- One scientific conference paper on multi-level banana plant disease diagnosis, presented in the 2024 International Conference on Computer-Aided Design.
- The features of the proof-of-concept prototype of the mobile robot platform – notably its robot-to-robot communication with ASIMOV-HAWKS – were demonstrated in the field in Davao del Norte during the joint testing of the ASIMOV Program.

Component 2: Autonomous Societally Inspired Mission Oriented Vehicles (ASIMOV) - Harmonized Aerial Watch and Knowledge-based Survey (HAWKS)

Project Summary

The HAWKS Project is the aerial component of the ASIMOV Program, the DOST flagship R&D program in artificial intelligence and robotics. The initiative aims to develop AI-enhanced autonomous robots capable of independent navigation with collision avoidance, vision-based feature detection, and environmental mapping.

2024 Accomplishments

The ASIMOV-HAWKS Project focused its efforts on testing the technology in the field with valued partners in the banana industry and refining the technology using the gathered data. The major accomplishments of the project include:

- Joined and completed the DOST-PCIEERD Short-term Program for Researchers on INnovation and Technopreneurship Program.
- Featured in the ***"Game Changer"*** segment of 24 Oras (GMA News) aired on 27 September 2024.
- Showcased its technology in the 2024 National Science, Technology, and Innovation Week (NSTW) at Limketkai Center, Cagayan de Oro City.
- Collaboration meetings with an academic partner from the National Institute of Physics, UP Diliman (UP-NIP) Team and the Philippine Space Agency.

Partners and Stakeholders

The intended beneficiaries of the ASIMOV Program are local banana farms including small growers, cooperatives, and large plantations that are affected by plant diseases such as Fusarium Wilt.

LGUs, researchers, and the academe are also key beneficiaries of the ASIMOV Program, as its services and data can significantly enhance the management and productivity of high-value crop farms. Notably, the partners of the program are:

- Biao Agrarian Reform Beneficiaries Cooperative (BARBCO)
- Provincial Agriculturist Office (PAGRO)
- DOST Region XI - Sentro Mindanaw
- Bagong Silang Banana Growers Multi-Purpose Cooperative
- Silliman University

Vehicle-to-Everything (V2X) Initiatives for Road Safety

Project Duration

01 March 2022 to 28 February 2025, Ongoing

Funding Source

DOST-PCIEERD Grants-in-Aid

Project Summary

The VIROS Project aims to improve road safety by developing a transportable intelligent traffic controller that integrates Artificial Intelligence (AI) and V2X for a data-driven traffic control system.

2024 Accomplishments

Since March 2022, the Project has been at the forefront of intelligent transportation systems innovation. VIROS integrates AI and emerging tech to transform traffic control into data-driven models. Notable achievements in 2024 include:

- Research publications:
  - Development of an Intelligent Road Safety Information Exchange and Traffic Control System for Philippine Road

Networks
  - Intelligent Yellow Interval Actuation Using Computer Vision

- Characterization of COTS V2X devices of various competing protocols to aid in the decision-making process on the future standardization and adoption of V2X technology in the Philippines.

Partners and Stakeholders

The VIROS Project focused on designing, developing and assembling a transportable intelligent traffic controller that integrates AI and V2X for a data-driven traffic control system for LGUs and traffic control agencies. Partners include:

- DOST-PCIEERD (Funding Agency)
- UP Intelligent Transport Systems Laboratory (ITS Lab)
- UP Department of Computer Science (UP DCS)
- UP National Center for Transportation Studies

Signal Assessment Using Geospatial Analysis Project (SAGAP) Phase II

Project Duration

01 January 2023 to 31 December 2024, Completed

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The SAGAP Project aims to generate radio coverage maps using satellite data as well as develop prototypes to monitor and process different kinds of signals from land, sea and air.

2024 Accomplishments

The project deployed three Automatic Identification System (AIS) in:

1) Metro Manila (Navotas Fish Port)
2) Dumaguete (BFAR 7 Provincial Fisheries Office)
3) General Santos City (General Santos Fish Port)

The team identified these ports with high traffic to help monitor ship traffic, marine-human activity, and other relevant marine protection efforts in the area.

The team also deployed an automated station capable of scanning radio frequency spectrum from 40 MHz to 6 GHz in Davao City (Davao Ground Receiving Station) for efficient radio spectrum management and protection. DOST-ASTI initially developed the RF Spectrum Monitoring station aimed at validating and assessing the use of radio frequencies in the country back in 2021. The SAGAP Team builds upon this foundation and integrated several improvements in both the hardware and software components of the system.

To visualize the data of the project, the SAGAP team also launched the SAGAP Portal. The SAGAP Portal visualized the spectrum traffic in a given area as well as ship traffic near ship ports where the SAGAP AIS stations are deployed.

Sustainability and Upgrade of the Existing Meteorological Buoy (Metbuoy+)

Project Duration

01 January 2024, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The Metbuoy+ Project is enhancing and sustaining DOST-ASTI's meteorological buoy system for offshore and inland water monitoring. By integrating advanced water quality sensors, improving LoRaWAN communication, and refining software functionalities, the project aims to deliver real-time environmental data to support maritime safety and prevent fish kills.

2024 Accomplishments

The Metbuoy+ team:

- Upgraded the water quality sonde, replacing the older model with an advanced version featuring pH and ammonium sensors, significantly improving water parameter detection.
- Integrated an ASTI-developed intelligent solar-charged controller (iSCC), which enables automated alerts when critical water quality parameters fall below safe thresholds.
- Implemented a detailed power monitoring and recovery algorithm to ensure automatic system restart in case of failure, maintaining continuous operation and preventing data loss—critical for real-time monitoring.

Further advancing the project, the team completed the design of a downsized buoy, which is now in development. This compact version will allow easier deployment in lakes and rivers, providing low-maintenance accessibility for government agencies, aquaculture industries, and other sectors reliant on water quality monitoring.

Design and Development of a Cost-Effective and Modular Autonomous System to Trace and Retrieve In-water Information via an Intelligently Driven Electric Rover (STRIIIDER)

Project Duration

01 January 2024 (Ongoing)

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The STRIIIDER Project is developing an Unmanned Surface Vehicle (USV) designed for real-time water quality monitoring. Equipped with AI-driven obstacle avoidance, precision Global Navigation Satellite System (GNSS), and multi-depth profiling

capabilities, STRIIIDER aims to autonomously collect critical environmental data to support water security and aquaculture. By leveraging open-source technologies and locally manufactured components, the project ensures accessibility, sustainability, and adaptability for government agencies and stakeholders monitoring lakes and rivers.

2024 Accomplishments

The STRIIIDER team made significant advancements in the USV's mobility system. These include a higher-capacity battery to support additional sensor payloads, a non-invasive propulsion and steering mechanism to minimize water disturbance, and a differential thruster system for enhanced maneuverability across various water conditions.

The team also developed an advanced programmable motor controller to enable precise sensor control and designed a custom winder system for controlled depth profiling, ensuring accurate multi-depth water quality assessments.

By continuously refining its capabilities, STRIIIDER is poised to revolutionize real-time water quality monitoring, offering cost-effective, data-driven solutions for environmental sustainability and aquaculture management.

Research Project - Tactical Reconnaissance for Operational Awareness (RP-TROPA)

Project Duration

01 August 2024 to 31 December 2024, Completed

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The RP-TROPA Project was established to develop an integrated system that enhances the Philippine Army's Battle Management Soldier-to-Armor Vehicle System while building local expertise for the seamless development and integration of a Battle Management System (BMS). This initiative aimed to ensure self-sufficiency in adapting to evolving military technologies.

2024 Accomplishments

Preliminary meetings with key Philippine Army representatives were conducted to gather feedback on the proposal and lay the groundwork for future testing and deployment. Collaboration with the Army remained strong, particularly in identifying areas for system improvement.

The team also designed an enhanced locally developed communication network to improve system performance across different environments. Key software features were identified for future upgrades, ensuring adaptability to emerging technologies. Several procurement requests were initiated to support these enhancements, with critical budget and procurement documents completed and approved by Q3, paving the way for the proof-of-concept development and testing in F.Y. 2025.

Moving forward, the RP-TROPA team will maintain close coordination with the Philippine Army to finalize plans for upcoming tests and demonstrations. Efforts are also underway to secure government funding for full-scale implementation in 2025, ensuring sustained development toward a modern, self-sustaining BMS for the country's defense forces.

Research and Capability-building in Autonomous and Unmanned Systems (AUS)

Project Duration

01 January 2020 to 31 December 2024, Completed

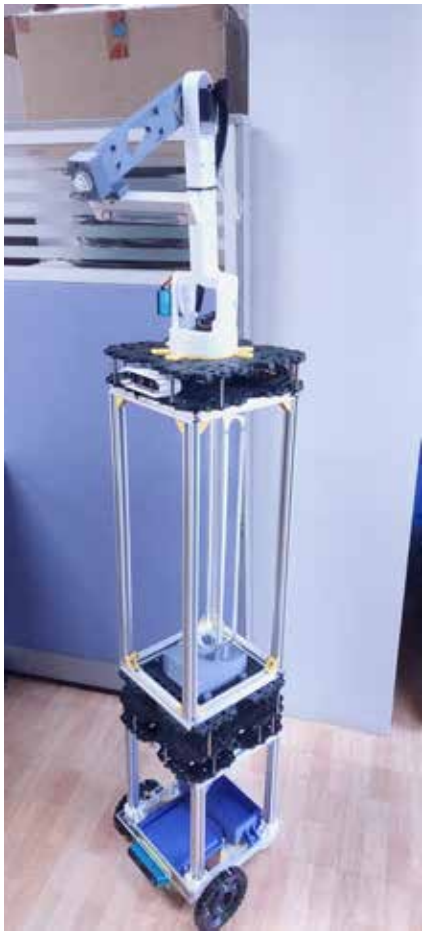
Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

As the need for effective sanitization grows, AI and Robotics are helping to improve cleaning methods while reducing human exposure to harmful chemicals. Traditional disinfection can be inefficient and time-consuming, often overlooking important areas.

This technology enhanced these processes by enabling automated, data-driven decision-making, ensuring optimized sanitization.



2024 Accomplishments

- As part of the development of the project, output from On-the-Job Trainees was continuously evaluated and incorporated to enhance the object detection capability of the robot.
    - Interns from the University of Rizal System (Morong Campus), Catanduanes State University, and De La Salle University (under PSYWP) were trained in data gathering, image processing, and AI fundamentals, with the latter also receiving training in basic Python programming and data annotation to enhance the mobile robot's object detection module.
    - Students from Quezon City Science High School were assisted on their surface water robot project.
- Delivered a presentation on *"Real World Applications of AI in Robotics"* at the Muntinlupa City Robotics Fair and Emerging Technology Exhibits.
- Revised and improved the robot platform design to address issues of first prototype:
    - Enhanced mobility by converting to a belt drive system, allowing the robot to navigate office environments more smoothly.
    - Redesigned robot chassis to be lightweight and maximize efficiency of sensor data collection.
    - Increased robot arm's degrees of freedom to be more flexible in navigating through 3D space.

The project aimed to contribute to the existing body of research in the field of autonomous and unmanned systems in the Philippines. AUS achieved this by developing an autonomous mobile robot that disinfects office workspaces.

CONNECT

Leveraging Satellite Bus Development Best Practices and Platform on arQ (arQ 2.0 / Level-up)

Project Duration

01 January 2021 to 31 December 2024, Completed

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The arQ 2.0 Project successfully concluded in 2024, marking a significant milestone in the advancement of remote data acquisition (arQ™) units—the core technology behind DOST-ASTI's PhilSensors.

Over its four-year implementation, the project focused on enhancing sustainability, optimizing baseline designs, and adapting to the growing demand for IoT-enabled remote monitoring solutions. The project's beneficiaries included DOST-ASTI hardware development teams, government agencies in agriculture and disaster risk reduction, and private institutions managing remote assets.

2024 Accomplishments

In its final year, the arQ 2.0 team successfully integrated an arQ™ unit prototype into the Metbuoy deployed in San Nicolas, Batangas, for pilot testing. This prototype features an ASTI-developed intelligent solar-charged controller (iSCC) and supports both LTE and LoRa connectivity, ensuring enhanced data transmission capabilities. Additionally, the team developed a health and threshold monitoring system that tracks the unit's overall status and predicts battery replacement needs, ensuring long-term reliability.

The arQ™ unit also underwent rigorous laboratory tests for electromagnetic compatibility (EMC) and product safety, validating its durability under real-world conditions. EMC testing confirmed LoRa stability under high-frequency interference and magnetic fields, while safety evaluations verified safe operation under 90°C, enclosure durability, and short-circuit protection against reversed DC polarity.

With these developments, the arQ 2.0 Project has laid the groundwork for future IoT-enabled sensing systems.

Automated Electronic Survey System

Project Duration

01 May 2018 to 30 June 2024, Completed

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

Survey systems have traditionally been developed by private industry for various applications, from population censuses to

industry-specific data collection. However, these systems often have proprietary controls that restrict users from fully verifying the security, reliability, and integrity of collected data. The AESS Project was developed to address these limitations by providing a configurable, transparent and secure survey system.

AESS is designed to benefit government agencies such as the Commission on Elections (COMELEC), Philippine Statistics Authority (PSA), and Department of Social Welfare and Development (DSWD), as well as the broader Filipino public.

2024 Accomplishments

One component of AESS was successfully reconfigured and deployed as Kalumbata v.2 for the ASTI Employees Association (ASTIEA) Election, enabling members to securely cast their votes. To support its wider adoption, the team introduced SELECT PH, a scaled-up version of AESS, to key policymakers, including the Office of Senator Francis Tolentino and the House of Representatives Committee on Suffrage and Electoral Reforms. These discussions explored its potential for national electoral and survey applications.

Establishment of Quantum Innovation Laboratory: Optimizing a Decision Diagram-based Free and Open-Source Quantum Circuit Simulator for Benchmarking in an HPC Environment using Entanglement, Random Circuits, and Quantum Algorithms Benchmark Datasets (QCS)

Project Duration

10 May 2022 to 31 May 2025, Ongoing

Funding Source

DOST-PCIEERD Grants-in-Aid

Project Summary

The Quantum Circuit Simulation (QCS) Project conducted several technical lecture series in 2024, majority of which were conducted in collaboration with the Quantum Computing Society of the Philippines (QCSP).

These lecture series aimed to foster a deeper understanding of quantum concepts, algorithms, and their applications, attracting participants from various academic institutions and industries across the Philippines.

Hackathon series were conducted at every end of the lecture series to encourage participants to apply their newly acquired knowledge in a practical setting, fostering innovation and collaboration among attendees.

Students and faculty members of the following academic institutions engaged in these hackathons to solve curated quantum algorithm design challenges:

- University of the Philippines Tacloban
- Polytechnic University of the Philippines - Research Institute for Strategic Foresight and Innovation

2024 Accomplishments

The Project Team published *"Driving Quantum Literacy: Multi-Stakeholder Collaborative Efforts in Philippine Education"* at the 2024 IEEE QCE in Montreal, showcasing its efforts to advance quantum computing knowledge in the Philippines.

The QCS Project team advanced in characterizing quantum circuits and algorithms, optimizing decision diagram-based simulations, analyzing tensor network-based methods, and developing an HPC job submission web application.

DataProtect: Protecting Data Using Blockchain Technology - Self-Sovereign Identity Empowerment: Reinventing Rights and Attributes (DataProtect-SIERRA)

SIERRA
SELF-SOVEREIGN IDENTITY EMPOWERMENT: REINVENTING RIGHTS AND ATTRIBUTES

Project Duration

January 2023 to December 2025, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

DataProtect-SIERRA enhances decentralized privacy through a secure data-sharing framework for applications and services, utilizing blockchain technology to safeguard personal and registry data.

The project incorporates CSC Form 212 (Personal Data Sheet) and educational details for credential verification, along with a mobile app under development for secure digital credential storage, thus promoting privacy-centric data management.

Blockchain technology ensures user data control, providing transparency and specific access permissions. SIERRA seeks to revolutionize privacy practices in web and mobile applications by tackling concerns related to third-party data usage.

2024 Accomplishments

The Project established these partnerships with industry leaders and academic institutions to foster blockchain research, development, and education in the Philippines:

- A collaboration with Twala was formed to validate technology, enhance capabilities, and support the integration of ICT in government agencies.
- The Project partnered with The BLOKC and Superteam Philippines to facilitate knowledge sharing, capability enhancement, and blockchain/Web3 innovation.
- A partnership with the Polytechnic University of the Philippines (PUP) was also established to foster research cooperation, technical knowledge sharing, and collaborative R&D projects in blockchain and Web3.

The project's outreach included the:

- Blockchain Campus Conference 2024 (Luzon and Mindanao legs).
- End-User Training and Workshop on Digital Document Signing and DataProtect-SIERRA System.
- DataProtect-SIERRA Training on Blockchain Technology Application in e-Government.

These are all aimed at promoting blockchain education and adoption across the Philippines.

Characterizing Schemes for Encoding First-Order Statistical Features and Textures Features in RGB Images into Quantum Data for Quantum Image Processing (QIP)

Project Duration

01 May 2024 to 31 December 2025, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The QIP Project explores the integration of quantum computing with traditional image processing to optimize compute and memory usage for complex tasks such as computer vision and satellite imagery. By encoding digital images into quantum-compatible formats, known as quantum image representations (QIRs), and applying quantum algorithms like translation and filtering, the project aims to advance quantum-enhanced image analysis.

Researchers continue to investigate optimal encoding schemes, positioning this initiative as a key contributor to developments in quantum computing at DOST-ASTI and similar institutions while complementing existing AI and machine learning techniques.

2024 Accomplishments

This project directly benefits scientific and academic researchers working in image processing, computer vision, and related fields. It has provided valuable training opportunities, including:

- Delivering an introductory image processing lecture for CSD interns.
- Conducting QCS+QIP Quantum 101 foundational training in quantum computing.
- Engaging in academic consultations with faculty from the PUP College of Engineering and the Ateneo ROSES Laboratory, fostering collaboration and knowledge exchange.

The team submitted a research paper to the 11th International Conference on Computing and Data Engineering, titled Benchmarking Decision-Diagram Based Quantum Circuit Simulation Performance on HPC.

Through research, training, and collaboration, the QIP Project continues to support the growth of quantum computing in image processing and allied fields.

Computing and Archiving Research Environment (COARE)

Project Duration

06 January 2024 to 31 December 2025, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

COARE is a High-Performance Computing, Data Archiving, and Science Cloud facility that allows free access of its services to the scientific research community. Data generated through these services become input to various discoveries or high-impact research and contributes to science-based policy and decision-making.

COARE provides services to researchers from the academe and government, students, and faculty.

2024 Accomplishments

- Capacity building
  - Training for HPC and Science Cloud use:
    - Basic HPC Training (Call for Individual Users) - August 29, 2024
    - HPC & Science Cloud Training (w/ PhilRice) - October 8, 2024
    - HPC Training (w/ TUP-Manila AKITA) - December 3, 2024
- COARE's current capacity
  - Computing
    - 4.3TB/44TB (90% available)
    - Scratch1/2: 279TB/462TB (40% available)
    - Scratch3: 269TB/449TB (40% available)
  - Data Archiving: 1PB/50TB (95% available)
- Support to the research community
  - Number of users supported: 798
  - New institutional partners: 14
  - Impact stories
    - Department of Science and Technology—Central (DOST): Infrastructure and IS Harmonization
    - Philippine Institute of Volcanology and Seismology (PHIVOLCS): GeoRiskPH, ACER Program, and Dynaslope
    - Industrial Technology Development Institute (ITDI): Vaccine Design and Vaccine Institute of the Philippines
    - Food and Nutrition Research Institute (FNRI): Hunger and Malnutrition Heat Map, Data Recovery/ Code Repository of the DOST-FNRI Systems, and Nutrition Survey Datawarehouse
- Hosted RDC Facility tours for Colegio de la Purisima Concepcion and the Philippine Air Force.
- #SpotlightOnWomenInHPC Social Media initiative
- On 04 December 2024, COARE hosted the Stakeholders' Discussion Meeting with the theme IPv6 Adoption in the Philippines: Reflecting on the Past and Present, Navigating the Future.
- Customer service satisfaction rating: 4.72 / 5

HR Lite

Project Duration and Funding Source

Phase 1: 19 December 2022 to 31 June 2024, funded by DOST-TAPI

Phase 2: 1 January 2024 to 31 December 2024, funded through DOST-ASTI General Appropriations Act (GAA)

Project Summary

To complement the HR Lite project funded under DOST-TAPI's TECHNiCOM program, a follow-up project under the name ***"HR Lite Phase 2: For the Government,"*** was implemented. Under this project, the following activities were undertaken:

1) Continued support to the third-party licensee that will be at the forefront of providing technical support to the government clients;
2) Conduct of important R&D activities (i.e., development of payroll system); and
3) Strengthened IEC activities to introduce HR Lite to the market.

HR Lite is a web-based application to streamline and automate common HR administrative processes.

2024 Accomplishments

Under the project's second phase, additional features were added to HR Lite. Specifically, a payroll module that processes salaries of contract-of-service staff was developed.

To pitch HR Lite to potential adopters and licensees, the project participated in various exploratory meetings, technical demonstrations, and presentations. The project signed a Memorandum of Agreement with four (4) agencies representing academic institutions, DOST Regional Office, and local government.

Two batches of User Acceptance Testing (UAT) were conducted:

- For Bicol University on 18-20 June 2024.
- A joint UAT for the Philippine Science High School Main Campus, DOST Regional Office V, Local Government of Alegria, and Tariff Commission 14-16 October 2024.

HR Lite v1.221 was eventually deployed in Bicol University and DOST Regional Office V. Training sessions were held at both institutions in August and October 2024.

Various government agencies representing academe, regional offices, and local government units are the target beneficiaries of HR Lite.

Design and Development of a Secure Entry with Keyless User Access Proof-of Concept Prototype for DOST-ASTI (SEKyU)

Project Duration

01 January 2024 to 31 December 2025, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The SEKyU Project aims to design and develop advanced security measures to provide high-level protection for entry points, incorporating technologies such as keyless entry and tiered access system to create a streamlined and secure access system, optimizing the user experience while maintaining robust security standards.

The system to be developed will be integrated into other internal systems of DOST-ASTI. The Project's endeavor to redefine security access systems seeks to instill confidence in occupants' safety while offering an efficient and adaptable solution for securing physical spaces in our Institute.

2024 Accomplishments

The Project designed and developed:

- A proof-of-concept hardware prototype. Working together with the Central Access Control Management System
- An API-driven centralized Door Access Management System for DOST-ASTI, allowing assigned users to control employee, guest, and temporary access.

These will be the foundation for a pilot implementation in DOST-ASTI next year. The project will benefit DOST-ASTI by establishing a centralized and scalable access control system, improving security, and future integration with workplace and automation.

Aksyon: A Service Management Solution for a More Responsive Government

Project Duration

01 January 2024 to 31 December 2026, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

AKS/ON is a service desk powered by iTop, designed to enhance government responsiveness through efficient service management. It streamlines request handling, improves issue tracking, and optimizes workflow automation for DOST-ASTI and partner agencies. By providing timely and well-organized service assistance, AKS/ON project aims to strengthen trust in government services while promoting efficiency, transparency, and accountability.

The team launched AKS/ON version 1.0.0, an enhanced iteration of iTop, featuring several key improvements. This version includes Time Tracking and Notify on Expiry plugins, enhanced system theme customization, UI label customization, and a modified format for generated forms, among other upgrades.

2024 Accomplishments

The Project pursued partnerships with external agencies by conducting project overviews and technical demonstrations. The following agencies participated in these engagements:

1) Philippine Tariff Commission
2) Agricultural Training Institute
3) Philippine Science High School System
4) Beacon Solutions, Inc.
5) Antipolo LGU
6) Bicol University
7) Philippine Statistics Authority
8) Rizal Technological University
9) Philippine Space Agency
10) Maragondon LGU

These collaborations aim to expand AKS/ON's adoption, improve service management processes, and strengthen inter-agency cooperation.

The project team also prioritized user training and skill development to ensure seamless adoption of AKS/ON:

- ITIL® 4 Overview Workshop for DOST-ASTI staff, facilitated by UBQTY Inc.
- Training Workshop on Service Management Practice to enhance service management capabilities.
- AKS/ON End User Training to equip DOST-ASTI staff with hands-on experience using the upgraded ticketing system.

Following these training sessions, the team officially launched AKS/ON at DOST-ASTI on 13 November 2024.

eDecide: an Electronic DECision-making Tool powered by a Data Analysis Environment

Project Duration

01 January 2024 to 31 December 2026, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The eDecide Project is an initiative designed to enhance data-driven decision-making within the government. By collecting, organizing, and analyzing vast amounts of government data, it aims to provide managers with valuable insights for more efficient governance.

The project focuses on developing an integrated information highway for new and existing systems through application programming interface (API). It revolves around three key components:

- The API Platform, which creates a robust infrastructure for secure and efficient data sharing across government systems.
- Web Portal for APIs, offering a user-friendly interface for stakeholders to interact with the platform.
- Dashboard, which provides visualized insights and analytics.

Through eDecide, agencies and stakeholders will gain access to real-time, comprehensive data analytics to support informed decision-making.

2024 Accomplishments

eDecide organized knowledge-sharing sessions and training workshops to enhance stakeholder expertise in using the API Platform, data analytics tools, and decision-making solutions. Notable activities include:

- KSharing on API Management and Power BI
- eDecide Training-Workshop on the API Platform and Data Analytics

eDecide has also engaged with various government agencies to demonstrate the platform's capabilities and explore collaborations through the following activities:

- Department of Foreign Affairs (DFA) - Office of the Undersecretary for Migrant Workers' Affairs (OUMWA)
- HR Lite Stakeholders Meeting (PSA, PhilSa, Antipolo LGU, Maragondon LGU, RTU)
- ASTICon HR Lite Stakeholders
- Regional Stakeholders Event in Pampanga
- Tech Pitch with the Tariff Commission
- Tech Pitch with the Agricultural Training Institute
- Tech Pitch with Tarlac Agricultural University

Full Automation and Streamlining Tool for Efficient and Reliable Public Service (ProcessFASTER)

Project Duration

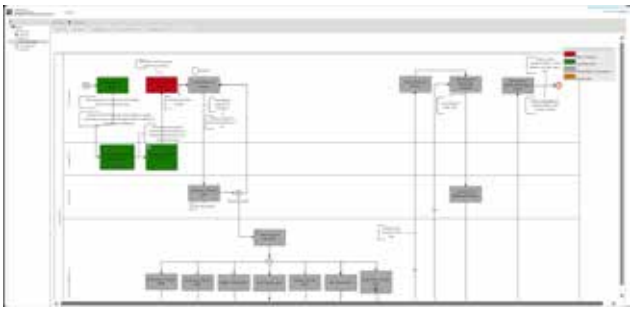
01 January 2024 to 31 December 2026, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

Process improvement is a constant challenge for management, focusing on consistency, quality, cost reduction,



and efficiency to ensure client satisfaction. Governments strive to provide fast, reliable services, making process transformation essential. While technology drives innovation, process efficiency is key to achieving better public service management.

A lack of understanding of how processes are designed, delivered, and improved can hinder progress. Focusing on process management concepts and skills is critical to delivering efficient services. Streamlined processes enable the government to fulfill its mission and objectives, ensuring transparency, growth, and better performance with reduced time and costs.

DOST-ASTI, in line with R.A No. 11032 (Ease of Doing Business and Efficient Government Service Delivery Act of 2018), is committed to transforming government services through collaboration and technology. ProcessFASTER, through Business Process Management, aims to create digital solutions that automate, improve and streamline processes, adding value to both the organization and its clients while proactively tackling long-term challenges.

2024 Accomplishments

- Deployed, streamlined, and automated three (3) DOST-ASTI Processes:
  - Pre-Mortem Process – early identification and planning activities of risks before project actual implementation.
  - Candidate Risk Register Updating – revisiting, review and management of project risks.
  - Post-Mortem Process – evaluation of completed projects and/or events.
- Participated in technology pitch / demonstration and showcases with 12 external agencies / entities.
- Conducted an End User Training for 55 ASTI personnel across various divisions in preparation for system deployment.

Automated Workflow for Research and Development Information System (AW4RDIS)

Project Duration

01 January 2023 to 31 December 2023, Completed

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The AW4RDIS project aims to automate and streamline DOST's R&D workflows using Business Process Management (BPM) principles. Processes are being analyzed, designed, developed, executed, and managed with the goal of improving them. It focuses on automating key R&D activities, starting from proposal submission and approval, monitoring of project reports, to project completion.

The goal is to improve R&D processes, enhance management, and provide effective management and monitoring of DOST-ASTI projects. While primarily focused on R&D, the project also streamlines and automates various internal processes, offering

flexibility to accommodate broader process digitalization needs.

2024 Accomplishments

The project concluded on 31 December 2023, with four (4) R&D processes successfully deployed. Since then, the team has provided ongoing support, maintenance, and system performance monitoring. Additionally, enhancements based on user feedback and process discoveries were implemented, leading to the release of AW4RDISv1.8.

The project received a request from the National Committee on Biosafety of the Philippines (NCBP) for assistance in the development of their own proposal application system, where the team had the opportunity to showcase the system capability. Efforts are also underway to integrate AW4RDIS with DOST's DPMIS project management system.

The project also conducted a hands-on training session on submitting project proposals. The activity aimed to refresh the knowledge of project proponents, managers, and other system users on proper submission procedures, while also enhancing understanding of how management can be more effective in monitoring and optimizing the system for efficiency.

THRIVE

IP Management Program for Academic Institutions Commercializing Technologies - Strengthening Intellectual Property Management for Upgraded Licensing and Adoption mechanisms of ASTI technologies for commercialization (IMPACT-SIMULA)

Project Duration

01 January 2024 to 30 June 2024, Completed

Funding Source

DOST-PCIEERD Grants-in-Aid

Project Summary

The IMPACT-SIMULA Project, funded by DOST-PCIEERD, aimed to strengthen intellectual property (IP) management, improve licensing mechanisms, and facilitate a more efficient technology transfer operations of the DOST-ASTI through capability building of its technology transfer officers and researchers. It also aimed to identify the direction of the Institute's technical projects to produce quality IP assets that are patentable and appealing to investors. Furthermore, internal policy, tools and other useful knowledge and business networks were created to improve processes and mechanisms for commercialization. While the project primarily focused on research outputs that were funded by DOST-PCIEERD, other high-value technologies were also considered during project implementation.

2024 Accomplishments

IP Management

The program successfully facilitated the filing of the following intellectual property rights:

- Four (4) Philippine patents filed for the following DOST-PCIEERD funded technologies: COARE, Gul.ai, STEER, REIINN Lokal-Fi.
- At least two other IPs which are DOST-ASTI's counterpart from its GAA budget: Various trademarks relevant to the above technologies.
- An Intellectual Property database for monitoring of the agency's IP assets.

Policy

The project created and executed an internal policy for measuring Technology Readiness Level (TRL) of DOST-ASTI research outputs. Through the project, TLO was able to participate in IP enforcement drafting activities led by DOST-TAPI as well as provide commentaries on the spin-off policy drafted by DOST-TAPI.

Processes

Under IMPACT-SIMULA, more than 30 researchers and technology transfer officers were trained for proper Invention Disclosures, Business Development, Spin-off preparation, IP auditing, basic data gathering and orientation on valuation, and other relevant knowledge on technology transfer. Moreover, 77 technologies were reviewed, audited, and organized for easier monitoring of IP assets, technology transfer plans, and potential infringement.

These filings demonstrate the program's dedication to securing IP rights for various technological advancements and ensuring their protection for potential commercialization. The dominance of university-funded technologies highlights the active

role of academic institutions in research and development, with substantial support from DOST and its associated councils.

Spin-Off and Licensing Plans

TLO assisted the researchers through the preparatory training and proposal drafting, conducted through a parallel initiative funded by DOST-PCIEERD to fast track its spin-off and licensing process.

Additionally, TLO negotiated a Technology Licensing Agreement (TLA) and drafted revised terms for the TLA which was eventually commercialized and underwent Fairness Opinion Board evaluation.

They also assisted researchers in partnership agreements to validate the technologies for future business development and technology transfer. A regional stakeholders' event was organized to encourage potential partners in transacting with DOST-ASTI researchers for future validation partnerships and investment.

The IMPACT-SIMULA Project has significantly strengthened DOST-ASTI's technology licensing and commercialization efforts. It enhanced technology protection through patents and copyrights, strengthened commercialization efforts through collaborative funding, and positioned innovations for global competitiveness through international patent applications. The team made notable progress in innovation, technology adoption, exposure to potential investors, achieving 100% completion in key policy, stakeholder engagement, and spin-off development goals.

Electronics Product Inclusive Innovation Center (EPIIC) Garage

Project Duration

01 January 2021 to 30 June 2024, Completed

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

EPIIC Garage was a dynamic research and development initiative by Electronics Product Development Center (EPDC) to propel EPDC as an electronics design and innovation hub. It significantly advanced the local electronics industry by achieving several key objectives:

- Produce locally developed electronic products.
- Commercialize these products through technology transfer modes.
- Provide essential development services to local designers and developers.

The initiative benefited a diverse group, including government agencies, private institutions, researchers, and academic institutions, all of which gained from the project's focus on local product development and commercialization.

Key Achievements

- Ash Bin Optimizer (ABO) prototype: Automatically collects and stores volcanic ash samples, reducing risks for researchers.
- Accurate Solution for Iodine Numeration (ASIN) prototype: Measures iodine content in table salt to ensure RA 8172

compliance.
- Electric Vehicle Conversion Kit (EV-Con Kit) proof of concept: Converts used fuel vehicles into electric vehicles.
- Laboratory Information System for Testing Accreditation (LISTA) software: Manages EPDC Testing laboratory activities per ISO-17025 Standards.
- Textile Evaluation using Linear Assessment (TELA) prototype: Uses a digital camera to count fabric threads and determine textile density, aligning with DOST-PTRI standards.

2024 Accomplishments

- Two (2) client visits
- Ten (10) educational tours
- Twenty-two (22) technical consultations

Information Network for Open and Viable Applications and Technology Exchange (InNOVATE)

Project Duration

01 January to 31 December 2025, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The Philippine Research, Education, and Government Information Network (PREGINET) is a government-led initiative aimed at providing a high-speed, reliable internet infrastructure to support research, education, and government services across the Philippines. It aims to foster collaboration and innovation by connecting universities, research institutions, libraries, and government agencies with state-of-the-art networking technologies.

Beneficiaries

- Direct: Academe (e.g. SUCs and HEIs), Government, and Research Institutions.
- Indirect: General Public, communities under the HNRD Agenda (i.e. DRRM, Agricultural and Aquatic, Health, Bioinformatics, etc.).

2024 Highlights

- Completed the PREGINET's *Asi@Connect* Network.
- [ON-IDLE] Co-organized the *"BGP & IPv6 Deployment Workshop"* at the PhNOG 2024 Week.
- Start-up of the new UPS for PREGINET NOC completed on 4 September 2024 – a short training on UPS management and operations was conducted for the OPS team.
- Maintenance of local links and international private lines.
- Continued partnership with Academe (SUCs and HEIs), Government and Research Institutions.
- Manage and facilitate service requests in compliance with the agreements / service level agreements.

Partnership

- Membership to RENs (APAN, TEIN-CC, SingAREN)
- Connectivity to Global RENs (via links to Hong Kong, Singapore, USA)

- Membership to PRAGMA, ASEAN HPC, ASEAN IVO
- PREGINET MOA with local and international partners

Sustainability of ASTI-Developed Technologies for Meteorological Data Acquisition Stations for Information Dissemination (SADT-MASID)

Project Duration

01 January 2023, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The MASID Project continues to enhance the deployment and sustainability of PhilSensors – a network of weather data collection stations that provide near real-time meteorological information for forecasting, research, policymaking, and disaster risk reduction in the Philippines.

Since 2010, over 2,000 PhilSensors have been installed in disaster-prone areas, supporting government agencies, LGUs, researchers, policymakers, and private entities in making data-driven decisions during weather events. The recorded data is publicly accessible through the PhilSensors website and mobile application (http://philsensors.asti.dost.gov.ph).

2024 Accomplishments

In 2024, the team upgraded the PhilSensors website and Android mobile application to improve accessibility and data interpretation. These enhancements included:

- Improved search functionality, the addition of favorite/recent stations, and the display of nearby active stations for user convenience.
- Integration of rain, temperature, and air pressure map interpolations for more comprehensive weather analysis.
- Enhanced graphical data views with hourly charts and water level alerts, increasing the system's usability for disaster preparedness.

Beyond system improvements, the MASID team provided consultation, troubleshooting, and configuration support to DOST-PAGASA, DOST-PHIVOLCS, DOST regional offices, LGUs, and private companies, ensuring optimized performance of PhilSensors.

With its growing relevance, MASID was showcased at the 2024 Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR), Tokyo Tech Tour, ASTICon 2024, and National Disaster Resilience Month, further strengthening collaborations and awareness in the field of disaster risk management.

Forecasting the Weather Using Lightning Observations as Safeguard for Hazards (FLASH)

Project Duration

01 January 2023 to 31 December 2025, Ongoing

Funding Source

DOST-ASTI General Appropriations Act (GAA)

Project Summary

The project *"Understanding Lightning and Thunderstorms for Extreme Weather Monitoring and Information Sharing"* has laid the groundwork for a dense lightning network across Metro Manila and select sites in the country. The study gathered, analyzed, archived, and processed lightning data to develop now-cast algorithms with a 0–6-hour lead time before an extreme weather event occurs.

The project aims to sustain the operations of the lightning network, specifically:

- Ensure continuous operations of the lightning and weather network for the collection of lightning and weather data.
- Ensure continuous archiving of collected lightning and weather to DOST-ASTI server as primary repository of lightning data.
- Ensure continuous service and enhancements for the web application for access of DOST-PAGASA and other stakeholders.
- Encourage other weather-related R&D in advanced fields and other applications.

The lightning network shall be utilized up to its life in aid of weather prediction and creation of disaster response strategies. Moreover, the R&D phase of this project has heavily invested in other tools to collect weather information through the help of JICA Philippines and the expertise of Hokkaido University, Japan.

2024 Accomplishments

The Project enhanced hourly weather forecasting by implementing hybrid methods like Bayesian Model Averaging (BMA). To identify the most effective techniques for meteorological forecasting, the team evaluated advanced machine learning models.

The team also carried out continuous maintenance activities on the lightning network in Metro Manila and regional sites in the country. Currently, they are developing a web visualization for the lightning and weather stations.

Technology Transfer

Technology Transfer Synergy Group

The Technology Transfer Synergy Group (TTSG) is composed of the following service units:

1) Business Development Unit
2) Corporate Communications Unit.
3) Technology Licensing Office.

The TTSG component units are the main actors driving the DOST-ASTI's technology transfer initiatives towards its goal of technology adoption.

The TTSG, amongst other things, is designed to be outward looking and conceived to help attain the DOST-ASTI's technology transfer objectives through collaboration, partnerships, and ecosystem-building.

Business Development Unit

DOST-ASTI launches its Business Development Unit to accelerate research to practical applications

The Department of Science and Technology – Advanced Science and Technology Institute (DOST-ASTI) has established the Business Development Unit (BDU) to help connect research projects with practical applications. This new unit aims to transform the Institute's research work into useful applications that can benefit communities and businesses.

Working together with the Institute's Planning Unit, Corporate Communications, and Technology Licensing Office, the BDU will focus on understanding market needs and finding partners interested in applying DOST-ASTI's technologies in real-world settings. Unlike traditional technology transfer initiatives that focus on licensing and intellectual property management, the BDU will take a broader approach-combining market research, commercialization strategies, and stakeholder engagement to ensure sustainable adoption of innovations.

Connecting Research to Real Needs

The BDU will help ensure DOST-ASTI's research addresses actual industry and community needs. By studying market opportunities, the unit will identify potential uses for the institute's technologies across various sectors. This approach will help DOST-ASTI develop solutions for practical challenges facing Filipino communities.

One such initiative is the adoption of HR Lite, a streamlined human resources management system developed by DOST-ASTI. Through the Knowledge Management Division Research Team and the BDU, local government units (LGUs) and other organizations have been exploring HR Lite as a tool to improve administrative efficiency. By working with potential adopters, the BDU ensures that technologies like HR Lite are utilized and attuned to the needs of end users, facilitating smoother integration and long-term use.

To stay relevant, the BDU will monitor industry developments, helping DOST-ASTI adapt its work in areas like information communications technology (ICT), microelectronics, artificial intelligence, and blockchain technology.

Practical Commercialization Approaches

A key part of the BDU's work will be developing business plans for DOST-ASTI's technologies. These plans will focus on creating sustainable ways to bring these innovations to those who can use them.

The Institute acknowledges that technology transfer is often a complex process with varying success rates. Moving from laboratory research to market-ready products involves navigating challenges such as adapting technologies to specific user needs, securing adequate funding for development, and addressing regulatory requirements. The BDU will work to identify these potential hurdles and develop practical strategies to address them.

Building Relationships

Understanding that successful innovation requires collaboration, the BDU will continue engaging with stakeholders through participation in trade fairs, conferences, and networking events to share DOST-ASTI's work and build useful connections with potential partners.

The creation of the BDU represents another step in DOST-ASTI's efforts to contribute to technology development in the Philippines. By helping move research from laboratories to practical applications, the Institute hopes to support economic development and address the needs of the Filipino people.

Corporate Communications Unit

Integrated Communications Strategy

The Corporate Communications Unit tells the story of the DOST-ASTI.

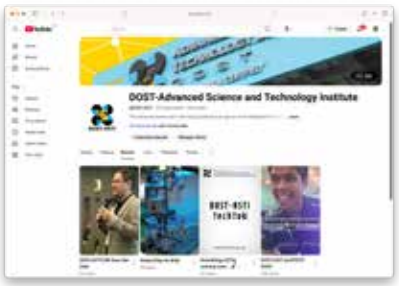
It does this through an Integrated Communications Strategy (ICS) by ensuring that the DOST-ASTI's message is consistent, unified, and cohesive across all marketing and communication channels, through traditional and new media, both online and offline.

The Corporate Communications Unit (Corp Comm), established in 2019, supports DOST-ASTI's Technology Transfer program by managing its internal and external communications efforts in alignment with the Institute's strategic goals. The unit works to strengthen the Institute's brand and visibility, promote its programs and initiatives, and encourage the adoption of its technologies through targeted stakeholder engagement and communication campaigns.

The team is responsible for a range of communication and production tasks, including development of media content and visual identity, implementation of communication plans and campaigns, and management of public relations, marketing and promotional activities across digital, print, and social media platforms. Corp Comm also handles the creation of publications and press releases, and provides support for exhibits and institutional events.

In keeping with the DOST-ASTI's culture of innovation the Corp Comm implements activities such as video and live event production to take advantage of modern communications channels to reach its audience.

As an example the Corp Comm generates content and produces videos published to its official Facebook page and YouTube channel, and has launched its DOST-ASTI TechTok channel on TikTok.



Corp Comm also generated content and videos from the ASTICON 2024 event, and will continue to do so for future ASTICON events.

Communications Strategies

DOST-ASTI's Corp Comm strives to execute the agency's communication initiatives to the highest professional standards while employing an interrelated set of strategies in designing communications activities and campaigns, amongst them:

- Content is King

  Generate content through various communication channels that tell the story of DOST-ASTI's R&D and technology transfer programs.

- Show and Tell (S&T) Expertise

  In order to be recognized as a leading R&D center the DOST-ASTI provides evidence and proof points as to its expertise and capabilities by producing content and conducting activities that demonstrate its know-how in its field of research.

- Create a Digital Footprint

  Utilize a digital first approach that takes advantage of digital media, platforms, and channels to reach the target audience.

- WHOA – Whole of Organization Approach

  Establish an organization mindset that everyone in the organization is a communicator, and that everyone is responsible for communicating DOST-ASTI's core messages.

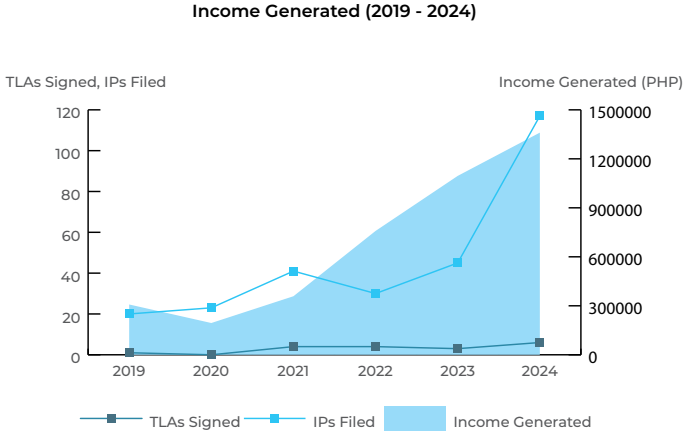
  In line with establishing this mindset communication objectives, strategies, and activities should be part of a research project's or technology transfer service's planning and implementation activities.

  In this regard, each research project and technology transfer service are to develop and have its own communications plan and resource allocation supportive of, and specific to, its objectives and that is in line with DOST-ASTI's organization-wide communications plan.

Technology Licensing Office

The Technology Licensing Office (TLO) safeguards and manages the Intellectual Property (IP) assets of DOST-ASTI's research and development (R&D) technologies, and promotes technology transfer by engaging with the government and industry stakeholders. Filing specific IPs such as patents, copyrights, trademarks, and industrial designs protect inventor's and author's rights as well as the Institute's interests and its industry partner's freedom-to-operate for business transactions.

TLO also facilitates knowledge transfer of scientific information and technology's novelty to industry adopters for product manufacturing,



process application, and service delivery through licensing, training and certification process activities.

2024 Highlights of the Service

Technology Transfer through Commercialization

Exceeded its target, TLO was able to facilitate six (6) signed Technology Licensing Agreements (TLAs), achieving 180% of projected technologies to be transferred for the year. Four (4) licenses for various technologies were issued to Ace Electronics Technology, Inc. from NCR, one (1) license was issued to Rockwell Enterprises from Region V, and one (1) license was issued to Weld Powertools and Construction Corporation from Region X.

This is the highest number of licenses issued for the past five (5) years.

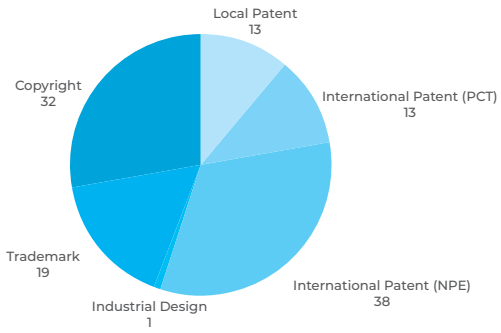
- Conducted due diligence for multiple technology licensing applications, including Rockwell Enterprise (from Region V) and EC Solutions (NCR).
- Negotiated licensing terms for the Limited Manufacturing Agreement with Jassen Harris Industry Corporation for future pre-commercialization of Resilient Education Information for the New Normal (REIINN).
- Technical Training for Licensee in coordination with Philippine Space Agency on AI4mapping.

Intellectual Property (IP) Management and Protection

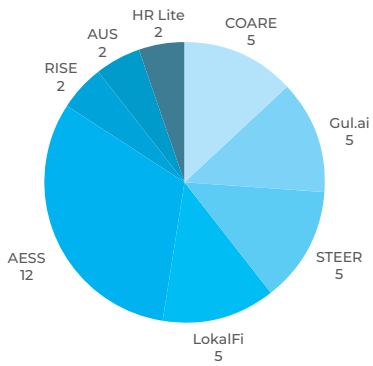
- Filed and registered numerous IP assets, including:
  - Fourteen (14) local patents filed:
    - AESS - 7
    - AUS - 1
    - RISE – 1
  - Thirteen (13) Patent Cooperation Treaties
    - AESS - 6
    - HR Lite - 1
    - RISE – 1
  - 38 National Phase Entries:
    - AESS - 14
    - HR Lite - 2
    - RISE – 2
  - 32 copyrights registered across various technologies
    - Gul.ai - 8
    - HR Lite - 3
    - ITANONG – 3
    - HR Lite – 1
    - COARE – 1
    - LokalFi – 1
    - Gul.ai – 1
    - STEER – 1
    - HR Lite – 1
    - COARE – 1
    - LokalFi – 1
    - Gul.ai – 1
    - STEER – 1
    - COARE – 5
    - Gul.ai – 5
    - LokalFi – 5
    - STEER - 5
    - LISTA (under EPIIC-Garage) - 1
    - NetMesh - 7
    - QCS - 2
    - REIINN - 3
    - SIERRA - 4
    - TELA (under EPIIC-Garage) - 1

- 19 trademarks filed for:
  - AESS Sanayan (rejected)
  - AKS/ON (2 trademarks)
  - ASTICon (2 trademarks)
  - ASIMOV-HAWKS (2 trademarks)
  - COARE (2 trademarks)
  - PREGINET (2 trademarks)
  - SARwAIS (2 trademarks)
  - Philsensors (2 trademarks)
  - MaSense (2 trademarks)
  - ROAMER
  - STEER
- One (1) Industrial Design filed for LTE Daughter Board (CAT-1) for arQ 1.1

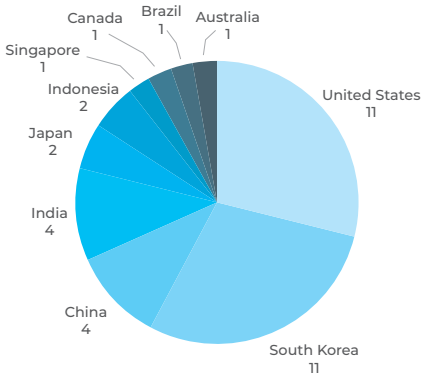
IPs Filed (2024)



National Phase Entries (by Technology) (2024)



National Phase Entries (by Country) (2024)



Key Stakeholder Engagements and Capacity-Building

TLO participated in multiple high-level meetings, trainings, and events, including:

- DOST-ASTI Coordination Meeting for PROPEL project with key DOST officials and other DOST-RDI Technology Transfer Officers.
- Strategic Trade Management Awareness Forum for the Philippine Academia hosted by Department of Trade and Industry (DTI)-Strategic Trade Management Office, in partnership with the European Union Partner to Partner (EU P2P) Export Control, and the United States Export Control and Related Border Security (EXBS) Program.
- Smart City Roundtable Discussion hosted by the US Embassy.
- Davao RSTW Presentation on technologies for commercialization.
- Cerv.ai and CerviQ government-industry collaboration exploratory business engagements for future commercialization of cervical cancer detection and prevention technologies.
- Intellectual Property Office of the Philippines Stakeholder's Event to strengthen IP-related networks and IP management operations of TLO.
- HANDA Pilipinas Luzon, Visayas, and Mindanao leg for business meetings, licensee and client technology pitching and display of technology prototypes.
- HIRANG 2.0 spin-off training for TLO members and chosen researchers.
- Regional Stakeholders' Event in partnership with DOST Region III for technology pitching and business matching activities.
- Regional Science and Technology Week Technology Pitching on DOST-ASTI Technologies for Commercialization in DOST Region V, DOST CARAGA Region, DOST Region VII, DOST Cordillera Administrative Region, and DOST CALABARZON.
- Regional Forum on Innovative and Emerging Technologies to Address Climate Change: Workshop on Strategic Approaches to Assessing Market Potential for Technology Innovations organized by DOST-TAPI and Asian and Pacific Center for Transfer of Technology (APCTT).
- TECHGROW: Technology Transfer and Entrepreneurship Collaboration and Harmonization of Growing Regional Opportunities on Wealth Creation organized by DOST XI.
- Training Workshop on Life Cycle Analysis of Technology organized by NAST PHL.

Financial and Administrative Impact

- A total amount of P1,003,922 (60% agency share) income was generated from commercialization initiatives.
- Updated valuation report for HR Lite and REIINN Project with inputs from the researchers and inventors.

Knowledge Management Support Services

2024 Highlights of the Services

Maintaining DOST-ASTI's Quality Management System and Compliance to Legal and Statutory Requirements

Demonstrating its commitment to providing high-quality products and services, the Department of Science and Technology – Advanced Science and Technology Institute (DOST-ASTI) successfully passed an external surveillance audit for its Quality Management System, based on the ISO 9001:2015 Standard. The multi-site audit was carried out by an independent certifying body, TÜV SÜD PSB Philippines Inc., on 01 to 02 August 2024, at both the ASTI Building in Quezon City and the Electronics Product Development Center in Taguig City.

The surveillance audit's scope covered DOST-ASTI's provision of information and communications technology (ICT) and electronics technology solutions through research and development, technology transfer, and science and technology services. After a thorough scrutiny of DOST-ASTI's processes, the external auditors concluded that the requirements of the standard have been satisfied.

Additionally, DOST-ASTI conducted two internal QMS audits in June and November 2024. To further enhance staff capabilities, an in-house ISO Awareness and Internal Auditor Course was held in 14-16 May 2024.

Also in 2024, the agency was able to successfully renew its Data Protection Officer and Data Processing Systems registration with the National Privacy Commission. The Annual Security Incident Report was likewise submitted by the agency through the NPC's Data Breach Notification Management System. A Privacy Impact Assessment Report for the agency projects and services that process personal information was also produced.

In compliance with the Ease of Doing Business Law, the DOST-ASTI also adhered to the Anti-Red Tape Authority's requirements such as but not limited to submission of the annual Client Satisfaction Measurement Report, Zero Backlog Certification, Harmonized Client Satisfaction Measurement Report, designation of the agency's Committee on Anti-Red Tape, and cooperation for the Report Card Survey 2.0 activities.

KM Unit In-House Training Initiatives

In 2024, the Knowledge Management (KM) Unit, in coordination with the Human Resource Management Section, successfully conducted in-house training sessions aimed at enhancing the agency's data privacy awareness and risk management capabilities.

These initiatives included the Data Privacy Awareness Training on 11 September 2024, which was designed to educate DOST-ASTI employees on data privacy principles, privacy risk mitigation strategies, and legal compliance requirements. Additionally, the Risk Management Training was held in 16-17 October 2024 to provide fundamental knowledge on risk, risk management concepts, and processes enabling the agency to effectively identify, assess, and mitigate potential risks.

These training programs contributed to the continuous improvement of the agency's processes, ensuring a more responsive approach to the needs of its stakeholders. The management of sensitive data was also strengthened, with a focus on safeguarding information while maintaining a commitment to innovative research and development efforts.

The knowledge gained through these training sessions facilitated the integration of data privacy best practices into the organization's operational framework. This was further reinforced through the automation of DOST-ASTI's Risk Registers and KM activities via the ProcessFASTER system, enhancing efficiency in risk assessment and mitigation measures.

Knowledge Management Activities

The KM Unit actively fostered a culture of learning and collaboration by conducting a series of KM activities in 2024.

Throughout the year, the following were held all aimed at improving how knowledge is shared and applied within the agency:

- Nine (9) Knowledge Sharing sessions
- Nine (9) Pre-Mortem sessions
- 10Post-Mortem sessions
- Three (3) After-Action Reviews

These activities played a key role in helping teams reflect on experiences, anticipate challenges, and refine strategies to enhance overall organizational performance.

By creating spaces for discussion and reflection, these initiatives supported better decision-making, encouraged innovation, improved efficiency, and strengthened teamwork. More importantly, they ensured that valuable insights and lessons learned were captured and retained, allowing the agency to adapt and respond effectively to changing circumstances.

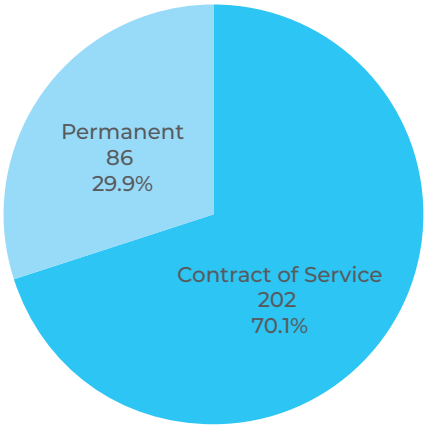
To make this knowledge easily accessible, all documentation and key takeaways from these activities were uploaded to the agency's Knowledge Base, providing a shared resource for employees to learn from past experiences and continuously improve their work.

Human Resource Development

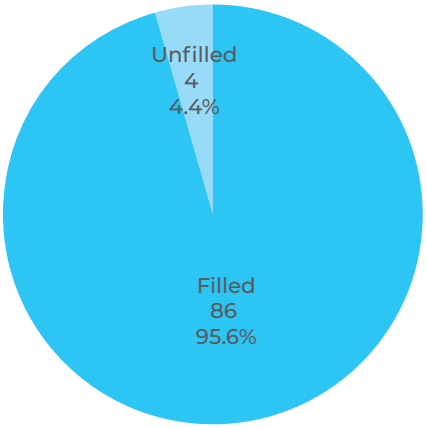
Personnel

As of 31 December 2024, DOST-ASTI's workforce comprises 288 personnel, of which, 86 are permanent employees and 202 are individuals engaged under Contract of Service arrangements.

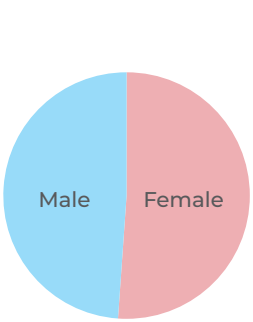
No. of Personnel CY2024



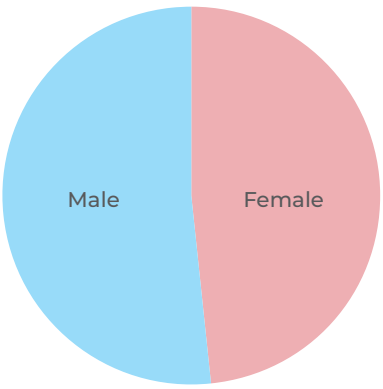
Filled vs Unfilled Permanent Positions



No. of Personnel by Gender



Permanent
Male 42
Female 44



Contract of Service
Male 104
Female 98

Learning and Development and Employee Welfare Activities

The Institute conducted various learning and development activities, including participation in both local and foreign training series, to enhance the competencies of DOST-ASTI personnel. These initiatives ensure that personnel are equipped with the skills and knowledge necessary to realize DOST-ASTI's vision of becoming a world-class leader in emerging technology research and innovation. In addition, employee engagement activities such as wellness sessions, flu vaccinations, and sports events were also organized to boost morale and improve employee retention.

This year, DOST-ASTI successfully conducted six (6) internal training activities focusing on disaster preparedness, internal auditing, IT service management, quality management systems, and gender sensitivity. Notably, 86% of its permanent personnel attended at least one training program during the year.

Moreover, the Institute hosted 42 students from various schools and universities for their On-the-Job Training and Immersion Program, reinforcing the Institute's commitment to providing students with opportunities to complement their formal education with practical experience, essential skills, and professional work ethics. In addition, DOST-ASTI onboarded 12 personnel under the President's Youth Work Program, equipping young individuals with valuable skills to enhance their employability.

Program on Awards and Incentives for Service Excellence (PRAISE)

The DOST-ASTI held its first PRAISE Awarding Ceremony following the Civil Service Commission's (CSC) approval of the ASTI PRAISE guidelines in September 2023.

Below is the list of awardees:

Educational Award
Victoria Vivian V. Victorino Master's in Business Administration

Loyalty Award	
5 years in service (as of July 2024)	Eduardo Lorenzo P. Buñag
	Jhon Albin R. Pagador
	Jenny Ann C. Tenorio
	Karl C. Cadapan
5 years in service (as of December 2023)	Keenan E. Pallasigui
	Meryl Regine L. Algodon
10 years in service	Ian C. Mosquera
15 years in service	Jayson C. Hernandez
	Jeffrey A. Aborot
25 years in service	Gay Concepcion S. Bugagao

Loyalty Award	
	Alvin E. Retamar
	Maricel Z. Castor
35 years in service	Narcisa Juvilyn C. Castañeda

In addition, the Institute recognized 16 peer-reviewed scientific papers that were published and presented as of December 2023.

Aligned with CSC Memorandum Circular No. 01, s. 2001, the DOST-ASTI PRAISE program was established to promote productivity, innovation, efficiency, integrity, and excellence in public service.

Gender and Development (GAD)

With the continued commitment to supporting the government's Gender and Development (GAD) advocacy, the Institute, through its Gender Focal Point System, organized various activities in celebration of National Women's Month in March 2024.

Key activities included a film showing, participation in the DOST-wide Kick-Off Activity—which featured a parade, Palarong Pinoy, a wellness session, and a mini bazaar—among others.

Similarly, the Institute actively participated in the 18-Day Campaign to End Violence Against Women (VAW) from 25 November to 12 December 2024. Notable activities included a film showing, the Orange Fun Run, Zumba sessions, and a webinar on Anti-VAW Laws in the Philippines.

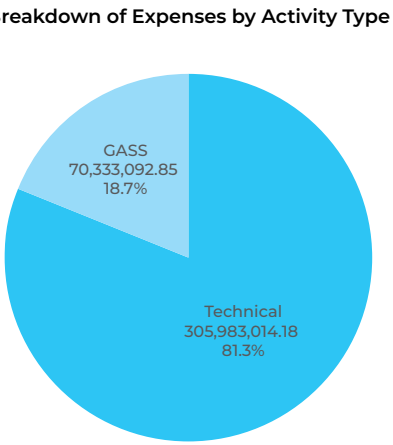
As part of the DOST-ASTI GFPS Technical Working Group, the Human Resource Management Section played a vital role in organizing and facilitating these activities. Furthermore, the DOST-ASTI is committed to fostering an inclusive and empowering workplace, providing equal opportunities for all employees across all aspects of human resource management.

Financial Performance

In CY 2024, the institute generated a total funding of P431,025,302.98 from the General Appropriations Act of FY 2024 and FY 2023 Continuing Appropriations. Of which, P376,316,107.03 or 87.31% was utilized as of 31 December 2024. Details shown below:

Particulars	Allotment	Obligations	Balances	% Utilization
A. Current Year's Allotment				
1. Regular Appropriations	389,047,000.00	352,898,876.00	36,148,123.14	90.71%
2. Automatic Appropriations (RLIP)	5,629,658.00	5,599,609.22	30,048.78	99.47%
3. Special Purpose Fund				
a. PGF	118,196.00	118,195.02	0.98	100.00%
b. MPBF	2,116,286.00	2,116,285.35	0.65	100.00%
c. CDT	999,998.00	999,997.92	0.08	100.00%
d. Unprogrammed - PB	3,104,904.00	3,026,783.23	78,120.77	97.48%
Sub-Total, Current	*401,016,042.00*	*364,759,747.60*	*36,256,294.40*	*90.96%*
B. Prior Year's Allotment				
1. Regular Appropriations	30,009,260.98	11,556,359.43	18,452,901.55	38.51%
Sub-Total, Continuing	*30,009,260.98*	*11,556,359.43*	*18,452,901.55*	*38.51%*
GRAND TOTAL	**431,025,302.98**	**376,316,107.03**	**54,709,195.95**	**87.31%**

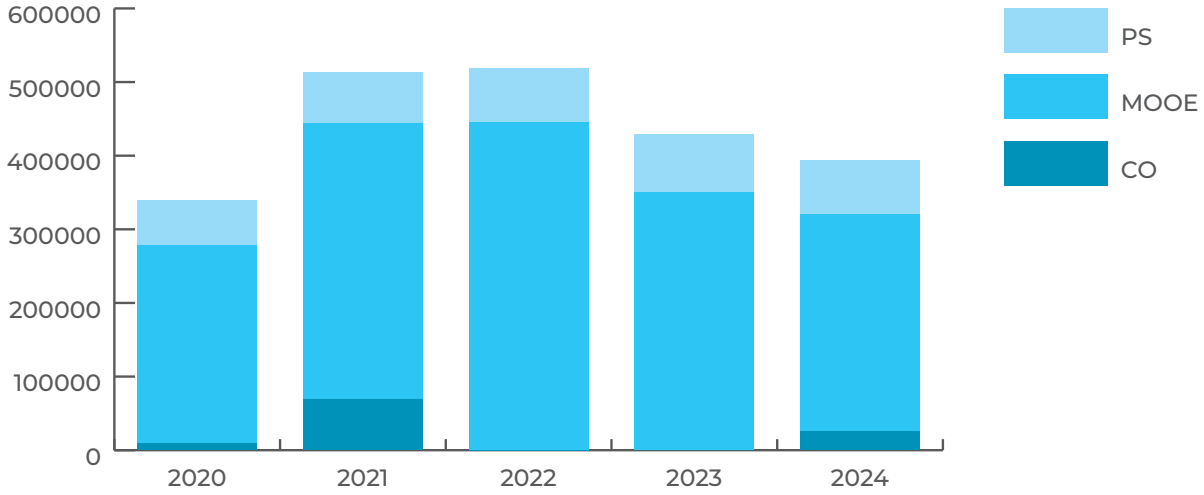
Out of the total allotments utilized by the institute, 81.3% was used for Research and Development as well as Technology Transfer Programs and Projects, while the remaining 18.7% was used for the General and Administrative Support Services (GASS):



The Institute's budget level was reduced by 8% from the 2023 level. Below is a 5-year comparative summary of ASTI's annual appropriations:

	2020	2021	2022	2023	2024
PS	61,839	68,741	73,228	79,938	73,911
MOOE	269,110	375,240	445,397	349,879	294,953
CO	8,878	69,048	515	0	25,000

Comparative Budget Levels
FY 2020 to 2024
(in Thousand Pesos)



Physical Performance

Project Duration

The DOST-ASTI implements several programs, activities and projects (PAPs) in the fields of ICT and Electronics that are aligned with the priorities and strategies identified in the Philippine Development Plan (PDP) 2023–2028 specifically Chapter 8: Advance Research and Development, Technology, and Innovation as well as the National Harmonized R&D Agenda 2022-2028.

These science, technology, and innovation undertakings have generated significant research and development milestones and technology transfer outputs that are measured in terms of the following key performance indicators:

Key Performance Indicator	2024 Target	2024 Accomplishment	Deviation
Advanced Science and Technology Research and Development Program			
Outcome Indicators			
Number of partnerships with public and private stakeholders and international organizations	7	6	(1)
Amount of revenue generated from partnerships	120,000,000	142,353,733	22,353,733
Output Indicators			
Number of projects completed	8	13	5
Percentage of projects completed which are published in peer-reviewed journals, presented in national and/or international conferences, or with IP filed or approved	100%	283%	183%
Percentage of projects implemented within the approved timeframe	100%	81%	(19%)
Advanced Science and Technology Transfer Program			
Outcome Indicators			
Amount of revenue generated from technology transfer and technical assistance	13,000,000	14,137,974	1,137,974
Percentage of clients who rate the quality of technical assistance provided as satisfactory or better	97%	99.7%	2.7%
Output Indicators			
Number of knowledge/ technologies diffused	13	20	7
Number of technologies transferred/commercialized through technology transfer agreement	3	3	-
Percentage of request for technical assistance that have been provided within the required timeframe	95%	99.9%	(4.9%)

Organizational Structure

The organizational structure of DOST-ASTI is composed of the Office of the Director (OD), Finance and Administrative Division (FAD), and four (4) technical divisions namely:

1) Research and Development Division (RDD)
2) Solutions and Services Engineering Division (SSED)
3) Computer Software Division (CSD), and
4) Knowledge Management Division (KMD)

Office of the Director

The Office of the Director (OD) provides overall welfare of the Institute, providing leadership and strategic direction. It steers policy formulation, ensures alignment with institutional goals, and monitors the effective implementation of plans, projects, and programs. The OD also oversees the planning and monitoring of research initiatives and institutional benchmarks, such as setting of performance indicators and evaluation of the results against these benchmarks.
Under the OD are three core support units: the Technology Licensing Office, Corporate Communications Unit, and Business Development Unit — all playing key roles in advancing the Institute's technology transfer and commercialization efforts.

Finance and Administrative Division

The Finance and Administrative Division (FAD) delivers essential support services that ensure the Institute operates efficiently and sustainably. It advises and assists the Director on budgetary, financial, administrative, and management matters, while managing services related to human resources, procurement, logistics, security, and facility management.

With the Human Resources Section under its wing, FAD leads the development of staff competencies and institutional capability-building programs to strengthen the Institute's workforce.

Research and Development Division

The Research and Development Division (RDD) drives the Institute's core R&D initiatives in ICT and Electronics, aligned with the national S&T agenda and industry development roadmaps. RDD focuses on three primary research domains: data network technologies, high-performance computing and applications, and smart autonomous systems. These initiatives aim to support research communities across the nation, advance frontier research, and generate relevant science-based solutions for national development.

Solutions and Services Engineering Division

The Solutions and Services Engineering Division (SSED) is the Institute's hub for applied engineering and systems design. It develops and deploys ICT- and electronics-based solutions for government, academic, and private sector partners — both as public service and through commercial engagements. Its technological focus includes information networks, embedded systems, software engineering, visualization tools, electronic product development, space science technology applications, and wireless technologies.

Computer Software Division

The Computer Software Division (CSD) spearheads research and innovation in software technologies, solutions, and quality systems. It develops reliable and scalable software solutions and provides consultancy in software architecture and development. CSD fosters collaborative partnerships with government, academia, and industry, while pursuing research in four key areas: innovative solutions (systems engineering), artificial intelligence systems, decentralized and secure systems (blockchain technology), and next generation computing paradigms and applications (quantum computing).

Knowledge Management Division

The Knowledge Management Division (KMD) supports the Institute's continuous improvement by promoting the effective use and sharing of institutional knowledge. It comprises two units: the Knowledge Management (KM) Unit, which curates and shares knowledge to support informed decision-making and staff development; and the Management Information Systems (MIS) Unit, which develops digital systems and maintains IT infrastructure to enhance operational efficiency. Together, these units help ensure knowledge is accessible, well-managed, and used to strengthen the Institute's performance.

Directory

Key Officials

Franz A. de Leon, Ph.D.
Director
Email: *franz.deleon@asti.dost.gov.ph*
Email: *ea@asti.dost.gov.ph*
Trunkline: +63 2 8249 8500 local 1100

May C. Cayaban
Chief Administrative Officer
Finance and Administrative Division (FAD)
Email: *may@asti.dost.gov.ph*
Trunkline: +63 2 8249 8500 local 1200

Peter Antonio B. Banzon
Chief Science Research Specialist
Research and Development Division (RDD)
Email: *peterb@asti.dost.gov.ph*
Trunkline: +63 2 8249 8500 local 1304

Paul John M. Serrano
Chief Science Research Specialist
Knowledge Management Division (KMD)
Email: *pol@asti.dost.gov.ph*
Trunkline: +63 2 8249 8500 local 1602

Alvin E. Retamar
Chief Science Research Specialist
Solutions and Services Engineering Division (SSED)
Email: *ning@asti.dost.gov.ph*
Trunkline: +63 2 8249 8500 local 1401

Joanna G. Syjuco
Chief Science Research Specialist
Computer Software Division (CSD)
Email: *joan@asti.dost.gov.ph*
Trunkline: +63 2 8249 8500 local 1300

Contact

Address and Contact Information
DOST-ASTI Bldg., UP Technology Park Complex
C.P. Garcia Avenue, Diliman, Quezon City
Philippines 1101
Trunkline: +63 2 8249 8500
Email: *info@asti.dost.gov.ph*

Technology Licensing Office
Email: *tlo@asti.dost.gov.ph*
Local: 1603

Bids and Awards Committee Secretariat (BAC Secretariat) / Procurement Management Section
Email: *bac-sec@asti.dost.gov.ph*
Local: 1206, 1212

Property and Supply Section
Email: *propertyandsupplysection@asti.dost.gov.ph*
Local: 2007

Publication Staff

Editor-in-Chief
Neyzielle Ronnicque R. Cadiz

Associate Editors
Murvi S. Cua
Angel Kristine S. Namuco

Writers

Chelsea Rica M. Abellana
Jeffrey A. Aborot
Aunhel John M. Adoptante
Meryl Regine L. Algodon
Stephanie Anne A. Alves
Maria Irene S. Amatorio
Roxanne S. Aviñante
Carlo R. Baltazar
Kezia Celayne I. Bayona
Antonio C. Briza
Neyzielle Ronnicque R. Cadiz
Narcisa Juvilyn C. Castaneda
Erica G. Concepcion
Miguel Luis T. Chua
Camille L. Copeland
Marygail Garet M. Dela Viña
Redison C. Dionisio
Nia Bernise F. Fabay
Rozette C. Fabros
Sarah Joy R. Francisco
Roy Vincent D.M. Gamboa
Karline Sheen D. Garcia
Geanne G. Guañizo
Jayson C. Hernandez
Maricar R. Lumauig
Charmaine Ann S. Manalo
Pinky R. Manio
Maria Cristina N. Manuel
Ross Romuel A. Mariano
Katrina T. Mina
Michelle P. Neverida
Vanesa O. Osiana
Jesica F. Pasos
Elena Mae Perez
Ramon Vann Cleff B. Raro
Rannie Loise N. Rubillos
Alexandra C. Solidum
Donabel Norei M. Soriano
Jelina Tanya H. Tetangco
Ma. Laarni B. Torreja
Kurt G. Valcorza
Kristine Angelica B. Valderosa
Riza Mae B. Villanueva

Graphics Design
Kristofer Ted S. Navarro

Photography
Axelaico C. Hagad
Kristofer Ted S. Navarro

Publisher
DOST Advanced Science and Technology Institute

Year
2024