Department of Agriculture

PHILRICE®

PHILIPPINE RICE RESEARCH INSTITUTE

2021

DA-PHILRICE R&D HIGHLIGHTS

INFORMATION SYSTEMS DIVISION

Content

DIVISION

Information Systems Division

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EXECUTIVE SUMMARY

The Information Systems Division (ISD) takes the lead in the development of information systems, and management of the ICT resources and infrastructure of the Institute. There were two core and one exta-core projects implemented by ISD.

Five information systems were developed, maintained, and enhanced under the Agricultural Information Systems (AgIS) Project as main, lead, and co-developer with other divisions. The Project Management Information System (PMIS) had a soft launching during the PhilRice Ugnay Palay in November. The launch featured the Performance Contract Report (PCR) module. The Contact Tracing System was developed primarily to monitor the COVID-19 situation at PhilRice. The mobile phone application doubled as the daily-time record system.

The Rice Seed Information System (RSIS) and the Rice Competitiveness Enhancement Fund-Seed Monitoring System (RCEF-SMS) were developed in collaboration with other divisions/units of PhilRice. The RCEF-SMS has a Text Center system with an application programming interface (API) with Globe-API subscription. The SMS is used in sending information to RCEF beneficiaries. This is also used by PhilRice-Batac in sending weather information to their farmer-cooperators and by the Development Communication Division to complement the PhilRice Text Center (PTC) in sending rice information.

Several information systems – web and mobile based applications were developed and maintained (e.g., Intranet Portal, Physical Inventory System, Germplasm Management System, Physical Plant Inventory System, and Document Management System).

The Financial Management Information System (FMIS), Property and Supplies Inventory System (PSIS), and the Human Resource Information Systems (HRIS) were developed under the Corporate Management Information System (CoreMIS). The enhanced version of FMIS, and the 2022 system were rolled out to all the branch stations. The PSIS and HRIS will be rolled out in 2022.

EXECUTIVE SUMMARY

The Business Continuity project covers the continuous management of ICT security, connectivity, and disaster recovery for resiliency. This includes system administration, maintenance and improvement of ICT infrastructure, and communication resources management. This project is a vital success for virtual meetings and seminars during the COVID-19 pandemic. The network and internet connections were efficiently managed to give priority to events needing preferential bandwidth traffic. Network disruption was minimized and security was hardened with the use of software and hardware-based systems.

Many network nodes were added with new buildings. Notable of these is the addition of the new Crop Biotech Center (CBC). The CBC had a wired and wireless network, telephone system, and CCTV system.

The PhilRice Data Analytics Initiative Project (RiceLytics) intends to harness Data Analytics to enhance the baselining and forecasting of the status of the rice industry. Specifically, it aims to establish Data Analytics models that will characterize the Filipino farmers, illustrate the Philippine rice industry situation, and portray the rice farming practices in the country. The project will develop an online Analytics dashboard that can be accessed by the public, especially the decision and policy-making bodies at different government levels for informed decision-making. Users can view historical, current, and predictive information about the rice situation, the rice farmers, and their farming activities at national, regional, and provincial levels. Through the project, a centralized data warehouse, analytics process, and results library will be established. Reports generation will also be automated through the online dashboard that provides readily available, easily accessible, and up-to-date information and insights.

Notable outputs of the project include the launching of the first version of the RiceLytics dashboard during the National Rice Research for Development Conference on November 5, 2021, which includes the development of the web dashboard thru the establishment of the in-house data warehouse and several cycles of prototype development and review, and the exploration of Tableau software and Machine Learning techniques XGBoost and spaCY.

PROJECT 1

Business Continuity

Consolacion D. Diaz (PhilRice-CES)

Business continuity covers the continuous management of ICT security, connectivity, and disaster recovery for resiliency. This includes system administration, maintenance and improvement of ICT infrastructure, and communication resources management.

The ICT infrastructure includes computer (fixed and wireless) and telephony networks, mobile telephony, network operation services (e.g., DNS, DHCP, NTP, and IP routing), servers, data storage systems (including backups), virtual machines, computer hardware, and software.

Information and Communication Technology (ICT) is an important component of the Institution. It supports the research, development, and administrative group in achieving their target output. Information and resources online must be available. Resource sharing and internal and external electronic communication are integral parts of the digital transformation of the Institute.

The extensive use of virtual meetings and seminars during the COVID-19 pandemic, increasing number of network-connected devices (e.g., mobile devices, printers, CCTV system), and the use of cloud-based services (e.g., Office 365) demanded for bigger and faster internet bandwidth. Internet bandwidth was managed by giving priority bandwidth use to important events and services.

- **Network Management**

  The firewall appliance managed internal and external connection security, and access to the network. Management and monitoring are done daily locally and remotely or as the need arises during weekends, holidays, and after office hours. Licenses for management modules (Intrusion Prevention System, Web & Application Filtering) installed in firewall appliance are renewed annually. These modules block, clean, and quarantine suspicious incoming files, data, and suspicious activities.

PROJECT 1

- **Server and Client Anti-Virus Management and monitoring**

  The anti-virus (AV) software protects servers and computers connected to the network. AV detects, neutralize or eradicate malware, and protect from computer virus and other kinds of threat such as worms and Trojan horse.

  The Institute has an annual subscription of eScan anti-virus for servers and 550 computers. Anti-virus is automatically installed on new computer. Signatures are automatically downloaded and uploaded to computers connected to the network.

- **Network Management and Monitoring**

  Bandwidth Management

  Access and connectivity are key components in the present working environment and easy access to information online. The increase in users and online services means the need to increase bandwidth capacity. There are three internet subscriptions with aggregate bandwidth of 150Mbps from two service providers (PLDT and Globe). These provide internet services to the whole campus LAN. A dedicated internet connection for PRISM is used for downloading and processing of GIS maps and servers. Another internet connection was also subscribed for RCEF use.

  Email Security Gateway

  `Email Security Gateway blocks emails that contain threats, spam, viruses, and other suspicious materials. Phishing emails are still the most common and successful method of compromising accounts. A hacker may succeed in obtaining login credentials thru email.

- **Full system and database backup and maintained**

  With the increase of the Institute's information and data, backup is necessary to prevent data loss, which can fully interrupt operations. Backups of the system databases can restore and recover the server system in the event of system failure.

  The backup schedule depends on the function of the system and databases. Network Attached Storage (NAS), external drives, and servers are the media used for storage.

PROJECT 1

- **ICT Equipment maintained and repaired**

  The ICT Maintenance online request system is already available in PhilRice Intranet System.

  The technical staff received service requests online, through walk-in clients, thru email, calls and messages. Service requests online totalled 2,607.

- **SAD of Network Monitoring System (NetMon)**

  Network Monitoring System is a web-based system that has two sub-systems, the Network Monitoring System and the Inventory System. The Network Monitoring System monitors network devices and server in real-time and sends alert and notification when a problem occurs. Inventory System records all IT resources, tracks and monitors maintenance and repair history.

- **CCTV System**

The closed-circuit television (CCTV) systems were installed throughout the campus to safeguard the human as well as the physical assets of the Institute. There are 192 CCTV cameras (outdoor/indoor), 2 NVRs, 1 DVR, and 1 server maintained and monitored daily.

- **Accounts Management**

  There are three existing email engines, Zimbra, a freeware, Outlook Exchange with per account perpetual license subscription and Microsoft Office 365 with annual subscription. There are 570 active network accounts, 1026 Zimbra email accounts of Service Contracts, and 285 outlook email accounts of permanent staff monitored and maintained.

  Based on the monitoring and reports from account holders, they encountered several spam and phishing attacks. Some problems occur when account holders give their usernames and passwords and others click links. Compromised accounts are automatically put into maintenance status until the account is cleaned. Messages with viruses, reported as spam, containing files blocked by the system or exceeds the allowed size are deferred, bounced, or rejected.

Most of the problems encountered by the account holders are: (1) forgotten passwords; (2) full storage, and (3) spam or phishing mails.

- **Communication Subscription Lines**
  There are 45 Smart and 3 Globe Postpaid Subscription Lines distributed to staff. ISD is in charge of the application for a new connection based on the approved request and the preparation of monthly payments for individual accounts.

- **Zoom Conferencing**
  Fifteen Zoom licenses are handled by ISD, nine of which are distributed to different offices. There were 3,435 meetings, including branch stations, conducted this year.

PROJECT 2

Agricultural Information Systems (AgIS)

Arturo C. Arocena Jr. (PhilRice-CES)

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PROJECT 2

Project Management Information System (PMIS):

This is a platform for crafting proposals to becoming protocols combined with an activity monitoring (PCR-maker) subsystem to report project implementation progress and accomplishment. Itensures that all implemented projects are linked to the major final output (MFOs) and have contributed to the outcomes of the Institute. It also enables branch and division Performance Commitment and Review (PCR) to incorporate staff involvement in other sectors, stations, divisions, or programs through modules where staff can input to the PCR all their involvement. The activity monitoring subsystem is currently on testing and the proposal to the protocol maker will be ready for preparation for the 2023 call for project proposals.

Five Work from Home (WFH) interfacing apps:

Contact Tracing System and App:

An Information System (IS) was developed and deployed in response to the emerging need for immediate consolidation of close contact of staff physically reporting to the office. The system also facilitates health declaration, monitoring, and control of individuals entering the campus or office to minimize possible exposure from those with symptoms and with contacts based on individual self-declaration data.

Physical Property Inventory App:

This Android-based app was designed to facilitate multi-user inventory activity. Staff with accountable assets may submit an inventory status of PhilRice property when required or in the event of borrowing such asset to track its temporary current use or accountability.

Personal Daily Time Recording App:

This app is an alternative to the stationary biometric used during time-in and time-out. In response to the pandemic, the project developed the DTR app, which strengthens the bring-your-own-device (BYOD) idea to collect time-in and time-out when reporting to the office or declaring the staff is on work from home arrangement for the day.

PROJECT 2

Although the function of time-in and time-out when physically reporting to office was superseded by the contact tracing app, it can still serve the purpose of declaring WFH arrangement for the day, which can be verified when linked to the approved arrangement.

Property Transfer and Disposal App:

This app facilitates database-driven documentation of transfer and disposal of property accountability. For the transfer module, the user needs to scan the property QR code of a property for transfer and input or scan the ID QR code of the reception staff which then needs to accept the same through the system. The property initiated for transfer, which when accepted will generate the transfer document ready for printing and signing of concerned personnel. On the other hand, the disposal module initiates the process of surrender of property accountability whether still working or not. Both processes end with the printing of the prescribed document for finalization and closure.

Application for Leave App:

This app is intended to initiate an application for leave of staff at any time, anywhere, and whenever necessary instead of delegating the task to somebody, who in many cases, does not follow certain rules and regulations on filing a specific leave privilege. Connected to the HRIS, all applications are stored in the same database as when initiating using the desktop user interface.

Farm Status Monitoring System (PhilRice Presence Plus):

An information system conceptualized to provide management with a consolidated visualization of implemented on-site and off-site projects and activities. Combining georeferenced data and drone-captured maps, the system can be integrated with other existing systems such as Philippine Rice Information System (PRiSM), Rice Crop Manager (RCM), Rice Seed Information System (RSIS), Rice Competitiveness Enhancement Fund (RCEF), and Minus-One Element Technique (MOET).

Currently, a prototype dashboard and conceptual design have been established, which will be fully developed in 2022. The established procedure will be radiated to all PhilRice

branch stations for a central monitoring system that can help in planning and decision-making.

The portal will be designed to function in time-series particular to the drone-captured maps. Users can then review the activities and situations of a concerned location at any time with just a click of a button (note: available images depend on the frequency of conducted flights).

PhilRice Data Warehouse Platform

The PhilRice data warehouse infrastructure is a combination of system and infrastructure to organize, store, and share processed information on both on-premise and cloud platforms.

Laboratory Unified Information System (LUIS) :

The LUIS was enhanced to integrate the borrowing and inventory status monitoring for chemicals, equipment, and consumables. The system was also configured to integrate with the Property and Supply Inventory System (PSIS) for monitoring the replacement availability of the borrower based on the project's Project Procurement Management Plan (PPMP).

An integrated user interface for researchers to facilitate their borrowing transaction where the laboratory manager of the source can approve or disapprove the request. Verification for the availability of replacement sourced from the requisitioner's PPMP is provided to the approver for reference in the approval process.

Laboratory managers can review the inventory list of equipment and the chemical inventory. An alert system for the low inventory and scheduled maintenance activity has been incorporated into the system.

RCEF – Seed Monitoring System

Enhanced the *Binhi e-Padala* and regular distribution system incorporating the QR code scanning function for the One-DA Interventions Monitoring Card, which solidified the stronger chain relative to Registry System for Basic Sectors in Agriculture (RSBSA) data of farmer-beneficiaries captured by the RCEF-SMS and the centralized RSBSA enrollment managed by DA-ICTS.

PROJECT 2

A system for quick data turn-out of verified farmer beneficiaries qualified for the *Binhi e-Padala* was developed. The system provides information on confirmed farmers, preferred variety, and expected sowing. These sets of information were critical for planning the volume and variety, date of distribution, and expected number of beneficiaries. Thus, facilitating the quick generation of claim codes and proper scheduling of text message provision to target farmers.

The data privacy agreement was also incorporated into the distribution system alongside the capturing of the KPs received by the farmer-beneficiary.