TOWARDS ELECTRONIC PHYTOSANITARY CERTIFICATION AND E-CERT ISSUANCE

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ELECTRONIC PHYTOSANITARY CERTIFICATES FOR AGRICULTURAL COMMODITIES IN MALAYSIA

Enhancing agricultural trade is an essential component in fostering sustainable economic development in the Asia-Pacific region. However, the procedures associated with trade in agricultural products are considered amongst the most complex, costly and time-consuming. Agricultural trade facilitation can be defined as the simplification and harmonization of procedures involved in the import and export of agrifood products, including but not limited to collecting and processing data and documents required for the cross-border movement of these products. Increasingly countries are adopting measures to streamline and automate the procedures involved in the trade of agricultural products, in order to enhance trade competitiveness; ensure food safety; and to reduce the time and cost associated with agrifood trade.

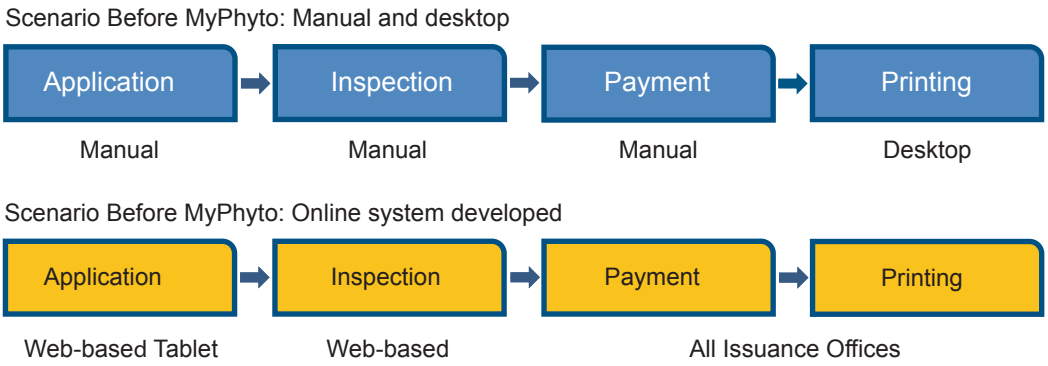
Electronic certification is an important means of facilitating agri-food trade. Complex global supply chains trade, advances in modes of transportation and increased trade volumes at entry points in the Asia Pacific countries has enhanced the importance of electronic certification (or e-Cert). Consequently, an increasing number of countries are moving away from the paper-based documentation system. Implementation of e-Cert will help reduce forgery, increase transparency and enhance predictability in trade in agri-food products, and facilitate faster clearance at the entry points. In light of this, Malaysia initiated the use of information and communication technology (ICT) in the early 1990's by developing the National Single Window (NSW) with the aim of improving the ease of doing business. In 2009, the NSW of Malaysia incorporated the e-permit system for importing agricultural products to ensure easier and speedy application of permits by importer. In 2011, the e-phytosanitary certification was initiated under the National Key Economic Area (NKEA) programme. The key objective of the NKEA programme is to stimulate a 20 percent increase in export of agricultural products and raise the nation's overall competitiveness.

The First Step

E-phytosanitary certification, or MyPhyto as it is known in Malaysia, is a centralised system for the application and the issuance of phytosanitary certificates (PC) to certify pest-free and biologically safe agricultural products for export. Due to widely dispersed agriculture production areas and numerous exit points in Malaysia it was necessary to implement this centralised online system, in order to consolidate information from all of the Phytosanitary Certificate Issuance Offices (PCIO) and harmonise the operating procedures amongst them. The project started with a User Requirement Study (URS) where the electronic phytosanitary certification development team, comprising of plant quarantine officers, exporters and IT experts, conducted field visits to all of the 19 PCIOs. The assessment study began

UNNExT United Nations Network of Experts for Paperless Trade and Transport in Asia and the Pacific
UNITED NATIONS ESCAP Economic and Social Commission for Asia and the Pacific
UNECE United Nations Economic Commission for Europe

Figure 1: Process Flow for issuance of Phytosanitary Certificates before and after development of MyPhyto



with the development team being briefed by the PCIO on the current operational procedures, starting from the application process by the exporter to the final printing of the phytosanitary certificate. The development team also collected information on exporter's profiles; inspection techniques; approval procedures; record keeping; reporting and activities associated with other government agencies. The development team gained some hands-on experience in the implementation of the current procedures at each office to better understand the process.

The development team was composed of experts with diverse and relevant expertise. This was particularly important as the URS results were based on the individual expertise of the team. The IT experts conducted the evaluation on the possible 'workflow' that can be automated and incorporated into the online system. The quarantine officer evaluated the need to comply with the related International Standard on Phytosanitary Measures (ISPMs) and sanitary and phytosanitary (SPS) issues to be addressed by the system in facilitating trade. The exporters evaluated from the perspective of the need to streamline the workflow to ease their trading activities. The development team deliberated on the URS results and came to the agreement that all phytosanitary certificate issuance offices follow the national standard workflow i.e. application, inspection, payment and certificate printing (Figure 1).

The findings of the URS indicated several differences between PCIOs in terms of their manual desktop computation, workflow sequencing, inspection procedures and reporting format. In addition, the duration for issuance of the phytosanitary certificate varied between 4–8 days depending on the location of the PCIO, number of staff members and number of phytosanitary certificates to be issued. The URS concluded that all four of the workflows (application, inspection, payment and printing) could be automated and harmonised. This would lead to more efficient procedures and shortening of the process from application to the issuance of phytosanitary certificates to less than two days. The study also showed that the online system could allow inspectors to address the issues related to approving phytosanitary certificates for non-compliant products and carry out amendments to the certificate without their supervisor's approval, which were done manually. Thus, the online system would only allow for officers of a certain level with the authorization for approval or amending the certificate. These activities would be traceable in system.

What is MyPhyto System?

MyPhyto is an online web-based system developed by the Department of Agriculture (DOA), Malaysia to meet the following objectives:

1. To enable an online application, processing and issuance of phytosanitary certificates for the export of agricultural products to be integrated with the Malaysian NSW;
2. To enable a zero face-to-face interaction and paperless issuance of phytosanitary certificates;
3. To standardize data storage and report retrieval for strategic use and as a starting point for the implementation of e-Payment services in the DOA;
4. To generate e-Phytosanitary certificate (e-Phyto) from the system to enable ePhyto to be sent to all National Plant Protection Organizations (NPPO) of importing countries for speedier release of Malaysian agricultural products;
5. To allow retrieval of e-Phytosanitary Certificate from other countries and to ensure the successful information exchange in bilateral arrangements for e-Cert.

The MyPhyto System Architecture

The system architecture was developed by the IT experts that also provide the IT programming. The main components of MyPhyto architecture consists of a web browser, business logic and database components.

i. The Business Logic Component

The business logic component is the main component of the system, which includes several modules including the "Exporter" modules and "Inspecting Officer" modules. The "Trail Audit" module supports the "Exporter" and the "Inspecting Officer" modules by tracing of user's activities in the system. The "Offline" module allows for

Figure 2: Architecture Design of MyPhyto after URS and UAT

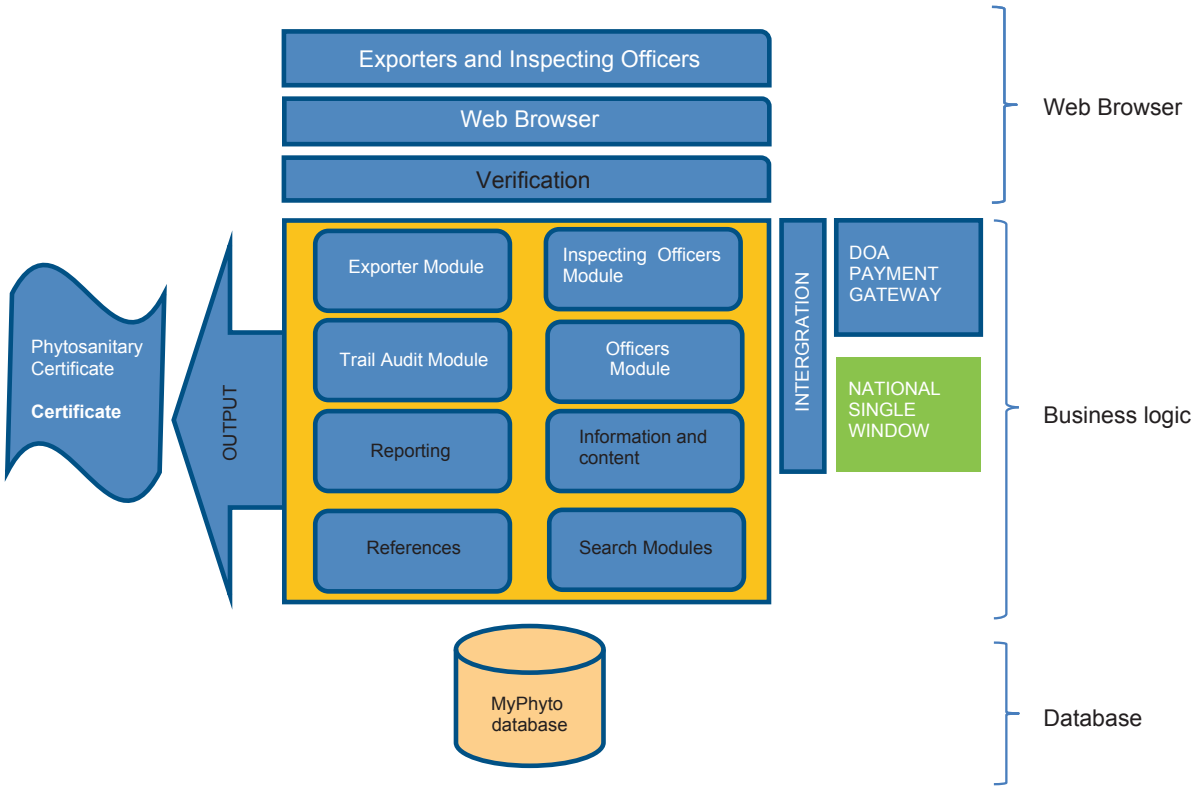
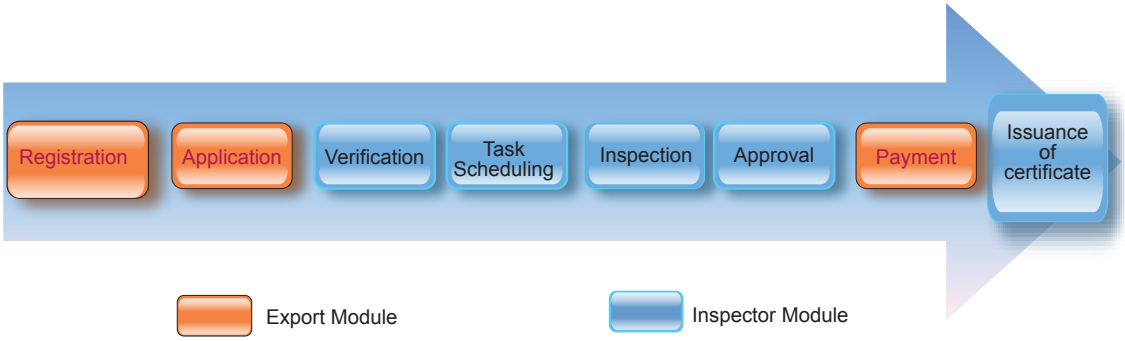


Figure 3: Web based user application workflow of MyPhyto



the system to run when there is no internet connection. The system also features "Reporting", "References", "Information and content", and "Search" modules. The business logic component is interfaced with the DOA payment gateway and the NSW for payment activities. It will also allow for the transmission of e-Phyto to the NSW for speedier export clearance. The architecture of the system as shown in the figure 2 was an outcome of the URS and User Acceptance Tests (UAT) by the development team. The UAT are tests conducted with selected users of the system to ensure that the web content meet their information requirements and that the web design is simple, user-friendly and easy to navigate. Their comments and suggestions would be considered in finalizing the webview modules and information content of the system.

ii. The Database Component

The Database Component is the storage place for all activities of the system and where data can be split into several servers. The Web Browser Component is the user application that consists of a workflow and modules that are designed according to the sequence of activities from exporter registration until the issuance of the phytosanitary certificate. The user application consists of a total of 8 tasks with 3 tasks for the exporter and 5 tasks to be handled by inspecting officers at different levels. This harmonized and standardized sequence of the workflow was agreed upon based on the findings from the URS, UAT and several consultations with all stakeholders including the inspecting officers as shown in Figure 3.

The development of the MyPhyto online system is entirely financed by the government of Malaysia. The

system programming was tendered out to an IT provider, however, the Department of Agriculture recovered the maintenance and development costs through a fee charged to the exporter. The system also provides the exporters with an e-payment option through the interface with the DOA payment gateway developed, which for security reasons was developed by a bank service provider. The MyPhyto system will be interfaced with Malaysia's NSW for the speedier clearance process at the exporting exit point of the commodities.

iii. The Web-based Component

The web-based user application workflow starts with the registration of the exporter. This module is designed to accommodate different categories of exporter, such as producers, traders, forwarding agents and a small group of individual exporters, who may be exporting agricultural products for research or samples. The exporters need to provide the required information in the registration module and also need to submit certified original copies of the registered information to the nearest PCIO for information verification. Once the system administrator has approved the registration, the exporters are ready to submit online applications for their phytosanitary certificates. Currently, the system does not charge any registration fee on registration as MyPhyto user.

The Application Module allows the registered exporter to apply for the issuance of phytosanitary certificate through the system. In order to do this, the exporter will need to specify various details including the commodity, quantity, country of import and treatment requirements. The exporter must also select the PCIO in which the application will be processed. A dropdown selection for most of the data fields is available for standardised data entry. Once the online application is completed, the exporter can just click on the send button for the application to be processed. The module also provides the exporter with the option to reuse the previous phytosanitary certificate application, if the information is similar, by changing the date and/or quantity.

The Verification Module is managed by the inspector's supervising officer for each PCIO. The supervising officer will conduct the verification in order to ensure that adequate information has been provided, and then assign a specific inspecting officer from the duty roster to perform the actual field inspection of the agriculture consignment intended for export. An email will be generated automatically to inform the exporter of the date, time and place of the inspection to ensure readiness of the consignment, documentation and treatments.

The Field Inspection Module will be conducted by the assigned inspecting officer using an android tablet equipped with a Wi-Fi sim-card. A reporting format is available in the tablets for the inspector to fill and send the report to the MyPhyto system upon completion for his/her supervisor to evaluate.

For the Approval Module only the supervising officer can log in to evaluate the report and ensure that the inspection complies with the sanitary and phytosanitary requirements of the importing country. Once the inspection report has been completed, the supervising officer will approve the issuance of the phytosanitary certificate and an e-mail will be generated to inform the exporter of the approval. The system will also automatically calculate the fee chargeable to the exporter. In addition, the exporter needs to make an online payment before the system allows the e-Phyto to be printed or issued in the form of e-Cert.

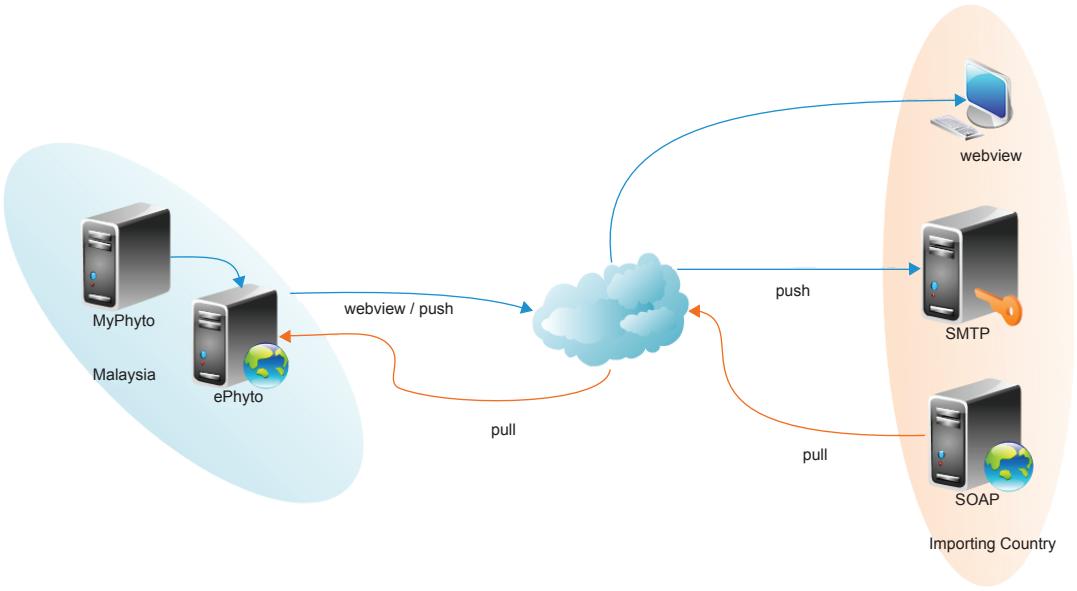
The Payment Module is only a link module of the MyPhyto system to the DOA payment gateway, which is provided by the banking service providers. The exporter needs to log in and select the mode of payment, which includes credit card, debit card or bank transfer. After the payment is made, the DOA payment gateway will then send a confirmation of the payment to the issuance of phytosanitary certificate module for further processing. The payment receipt will be automatically generated by the system for the exporter's records and will also be made available for the printing option.

The Issuance of Phytosanitary Certificate Module can generate either a printed certificate or be in the form of e-Phyto (e-Cert). During the application, the exporter can choose between a printed certificate or e-Cert. For the printed certificate option the exporter can collect the certificate either at the PCIO which has processed the application or at any PCIO of their convenience. Printing is not allowed to be conducted at exporter's premises since the phytosanitary certificate is coded with security features and the font size is standardised by a specific type of printer. For the issuance of the e-Cert option, the exporter will be provided with a reference number for the e-Cert for their consignment and this e-Cert is then transferred from the MyPhyto system to the e-Phyto system for e-Cert to sort and process it before it is sent or retrieved by the importing country.

Exchange of e-Cert

Exchange of e-Cert is provided by the e-Phyto system, which is a separate online system from the MyPhyto. The e-Phyto server stores the e-Cert in Extensible Markup Language (XML) format in compliance with various ISPMs and UN/CEFACT standards. The e-Cert will be sorted according to the importing country folder. The system programming provides three options for sending or retrieving e-Certs by the importing countries: (i) through 'webview' user application browser; (ii) by system to system transfer using push or pull through Simple Mail Transfer Protocol (STMP); or (iii) by application to application transfer using Simple Object Access Protocol (SOAP) as shown in figure 4. The choice of using STMP or SOAP will depend on the programming of the e-Cert online system in the importing country.

Figure 4: The schematic diagram on the exchange of e-Cert between e-Phyto and importing countries online systems



For the 'webview' user application browser, the e-Certs will be exchanged after an agreement between the NPPO of the importing country to utilize this facility with the NPPO of Malaysia. A memorandum of understanding on the usage terms of reference will be signed between the NPPOs to ensure that the provided data will be used only for trading and SPS requirements. The importing country will be provided with several usernames and passwords to log in into the e-Phyto system depending on the number of users and entry points that handle the import of agricultural products from Malaysia. Upon login into the 'webview' browser, the user can search for the phytosanitary certificates that have been issued to their country based on the commodity, by using the status of the certificate or the certificate reference number. In addition, the user can download or view the phytosanitary certificate online.

Through the 'webview' browser, the user can also provide feedback on the status of the certificate and whether the products certified by the particular e-Cert have been either released, released with treatment or have been refused entry. These feedback mechanisms will allow XML and the format is based on international standards. The meeting should also discuss issues related to security of the exchange, such as e-signature and authenticity of the e-Cert. In order to exchange e-Cert between countries, the NPPO of Malaysia has engaged in several negotiations with a view to implement system to system transfer of e-Cert. These countries include Australia, New Zealand, Netherlands, Korea, Indonesia and Singapore.

Success Factors

The development of the online phytosanitary certificate application system was initiated due to the need to facilitate agricultural trade, in line with the development of the NSW of Malaysia, in order to have speedier clearance, predictability and transparency in agricultural imports and exports. The need for a system for speedier processing times was also requested during meetings and dialogues with stakeholders such as agricultural exporter associations, forwarding agents, packinghouse service providers, phytosanitary treatment providers, seaport service providers and related government agencies.