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The Use of Electronic Data Forms in the PNG Purse Seine Port Sampling Program

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The Papua New Guinea National Fisheries Authority (PNGNFA) has developed electronic forms (e-forms) for use by port samplers. The e-forms capture species and length data, vessel, well and catch information has been amalgamated into an android application. The application can be easily downloaded onto electronic devices such as tablets and used to enter and transmit data electronically as emails from the tablet to the Fisheries Information Management System (FIMS) which is currently being developed by PNGNFA. The port sampling android application is a homegrown initiative of the PNGNFA and is the first application trialed and already in use in PNG. To date over 650 000 individual samples have been collected using this system since its inception in March this year.

Over the past four years the port sampling program has been operating intermittently to collect independent fishery data from the purse seine fishery with the aim of monitoring species composition, size classes as well as build capacity for fishery monitoring and data collection in the future. The sampling design used generated large amounts of data which then posed several challenges in data entry, assessment of the information collected and the timeliness of these assessments.

This new system of electronic data transfer from port samplers via tablets directly to a web based database allows for faster processing of data reducing the time needed to re-enter the data from paper forms into a desktop database application. Data can then be easily reviewed and available for analysis.

This paper presents a brief overview of the different sections of the application and how data is entered and transmitted electronically.

LOGGING IN

Each Port Sampler is given a unique identification number so the eforms can be accessed only by them. The application has specific user settings to show a particular authorized user (Fig 1).

When a user has logged on to the application, a record of the number of unsent emails is shown and the date and time of the last email. There is also an option to check for updates, this allows samplers to update the application when updates are available. An e-review option is also included to resend any data that may have not been successfully transmitted.

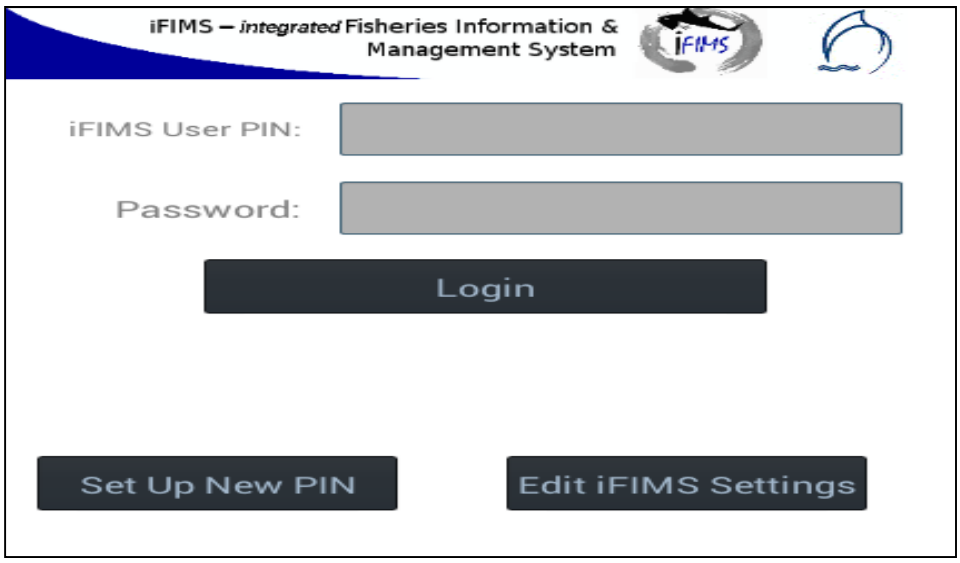


Figure 1: Log in Screen

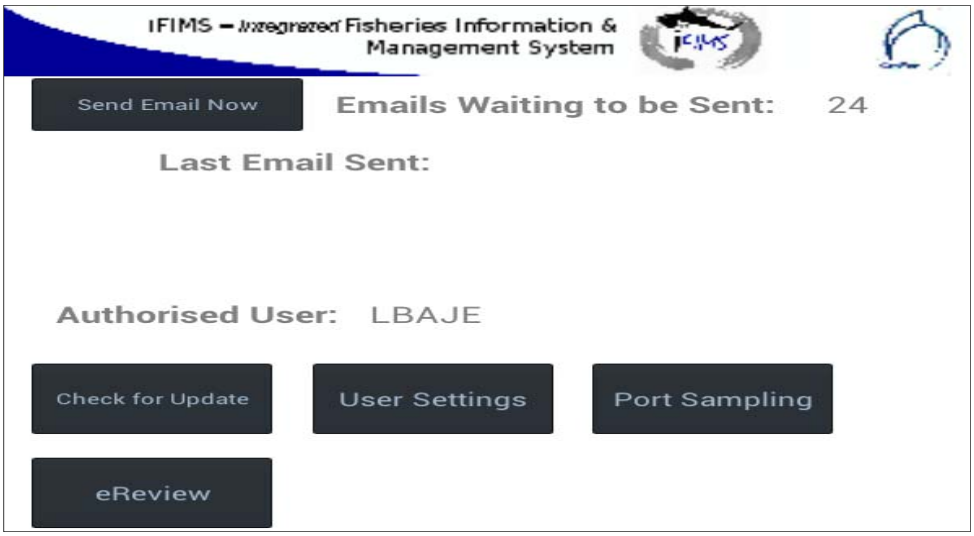


Figure 2: Screen showing user and options for update and eReview

ENTERING VESSEL DETAILS

The first set of information entered is the port name, vessel details, unloading and Observer Trip Id if the vessel is a purse seiner. The application automatically generates the date and GPS positions of where the data is being sent from minimizing repetitive data entry.

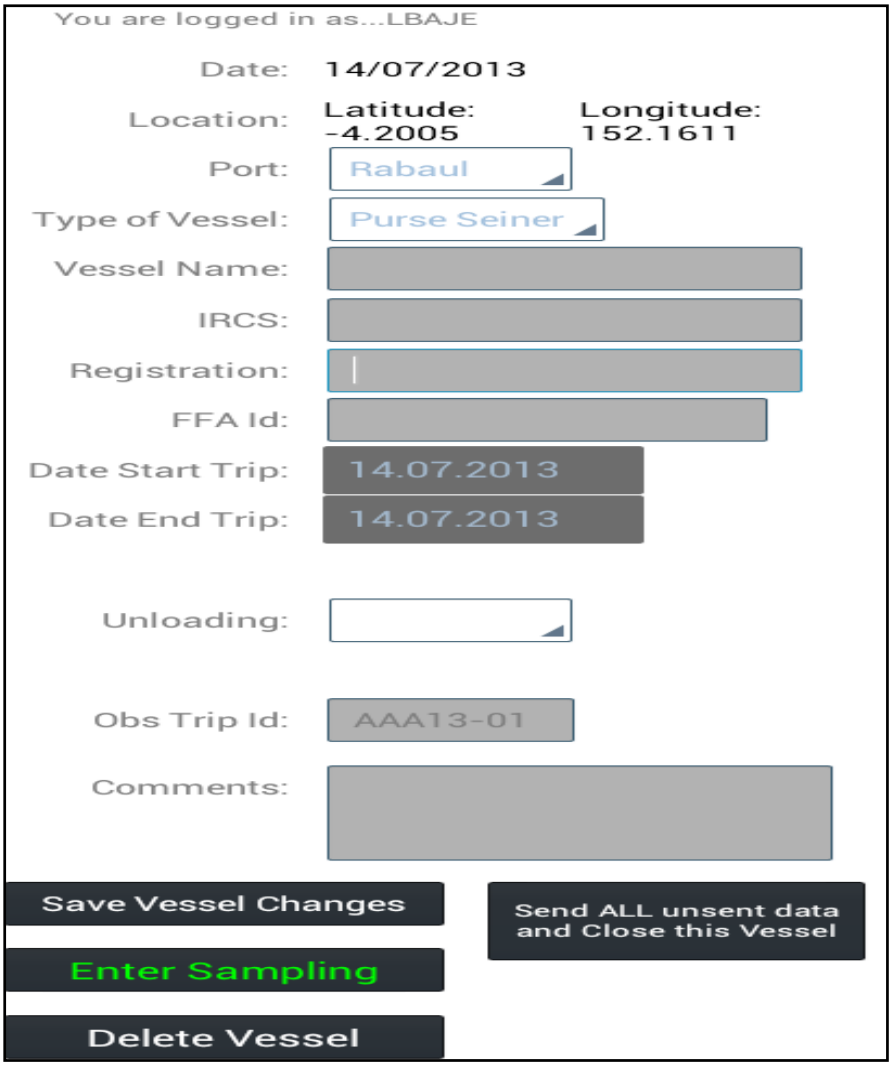


Figure 3: Vessel Information

Primary vessel information in order to begin entering species and length data is the Port name, type of vessel, vessel name, International Radio Call Sign and the vessel registration number. Other information if not acquired at the present time can be later added and any changes saved to update vessel details. Trip dates can be adjusted accordingly.

ENTERING WELL AND NET DETAILS

The next section allows samplers to add information about individual wells that are sampled and nets that are sampled from these wells (Fig 4, 5 & 6).

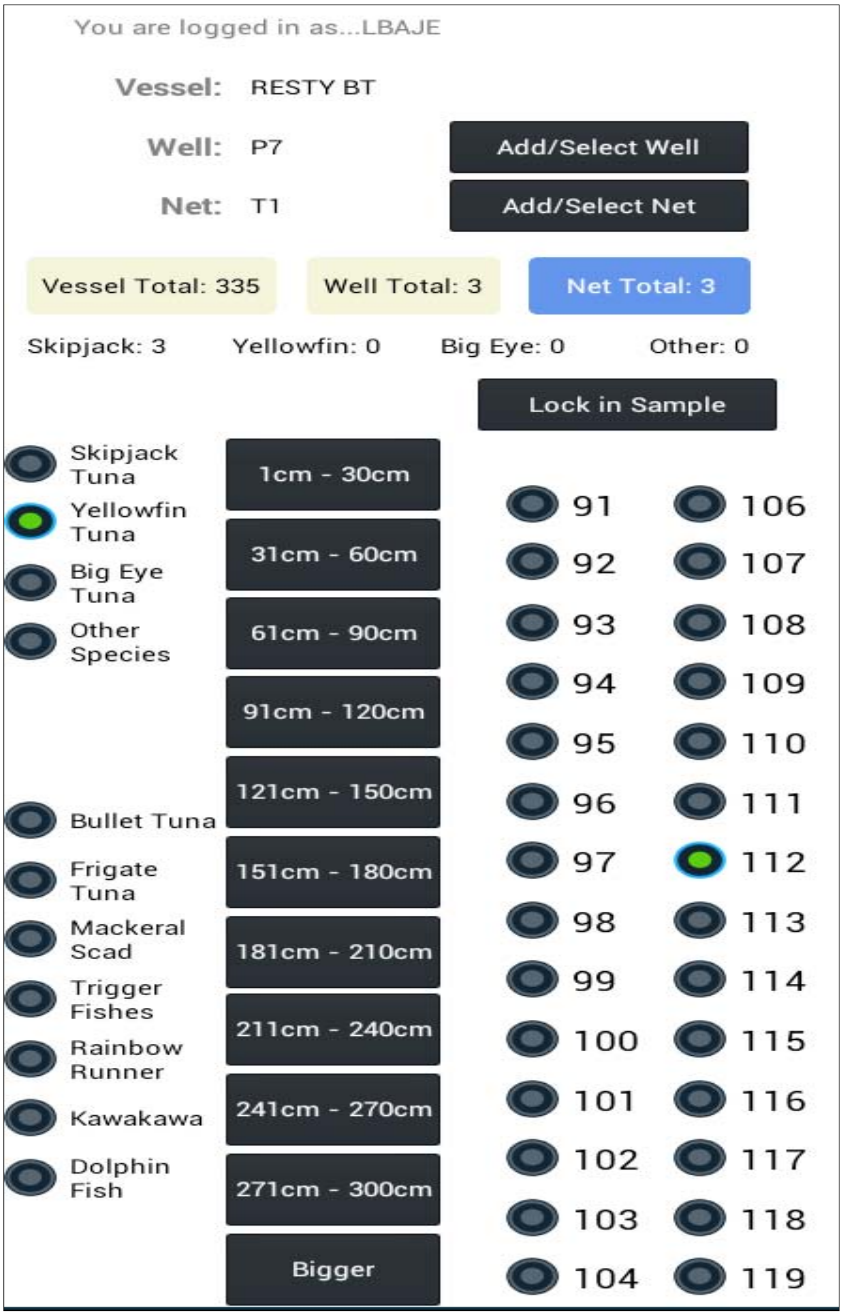


Figure 4: Selection of Well, net, species and length

Figure 5: Entering new well information

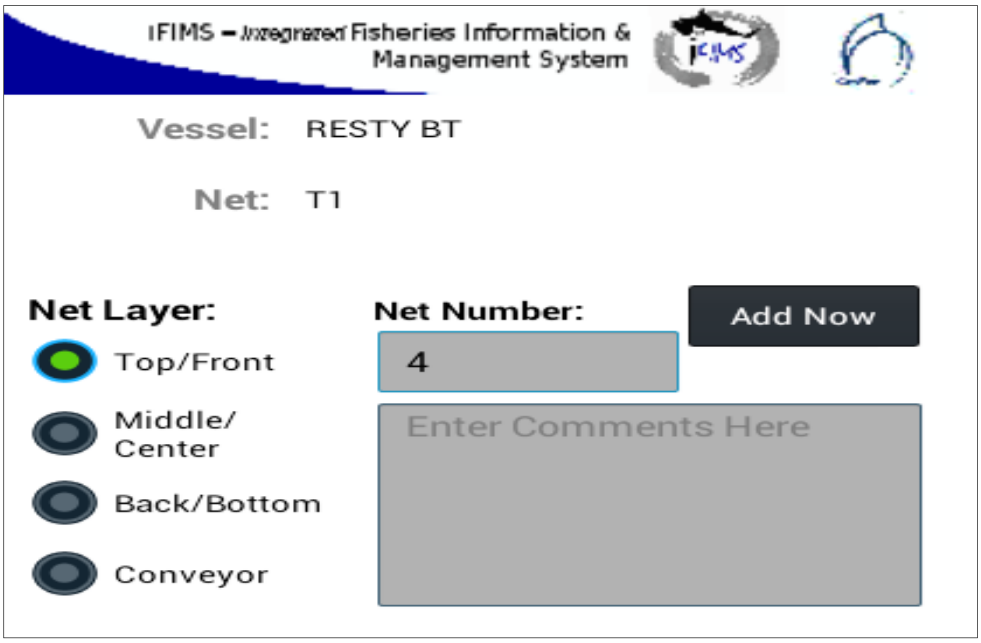


Figure 6: Entering new net information

ENTERING SCHOOL ASSOCIATION AND CATCH POSITIONS

The catch e-form allows input of school association and set catch positions as well as multiple entries of this information if needed (Fig 7).

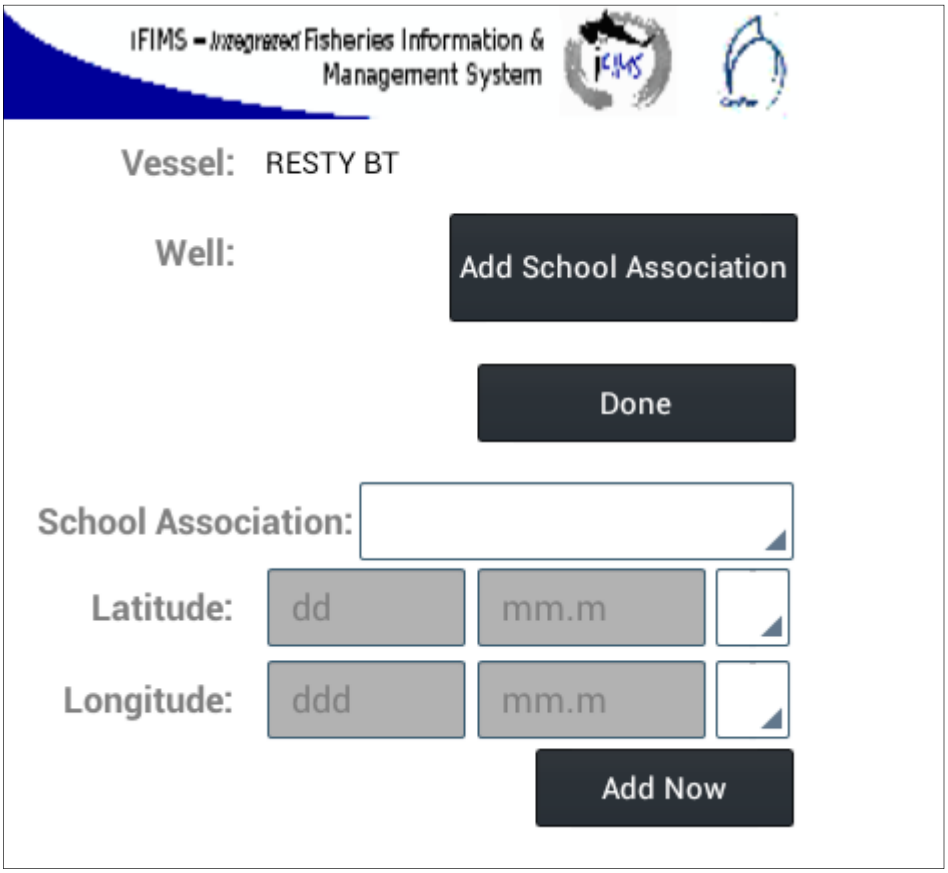


Figure 7: Adding school association and catch position

ENTERING SPECIES AND LENGTHS

To enter species and length details the appropriate species must be selected before lengths are entered. Based on the size of the samples the appropriate range of lengths in centimeters is selected which displays all the lengths within that range. Samplers simply choose the corresponding length to that of the sample and "*Lock in Sample*" which registers a particular sample and then follow on with the next length and so forth to continue entering samples ready to be sent when sampling is complete (Fig 4).

The application also automatically computes total number of samples taken from a particular net as well as for a particular well and an overall total for each vessel.

Common bycatch species are listed for ease of selection. Any other species can simply be added by selecting *Other Species* which presents a list of species names to choose from.

Length validation rules are set for the main tuna species to guard against data entry errors. If a length measurement outside the set range for a particular species is entered, a message will appear asking samplers to check if it is correct.

MAKING CORRECTIONS AND EDITING INFORMATION

At times when changes need to be made to correct errors, the application is designed to allow for changes to be made to vessel, well and net details. Length and species entries can only be deleted one at a time to ensure that large masses of data are not accidentally deleted. Messages confirmation messages appear before any data is deleted to maintain accuracy (Fig 8).

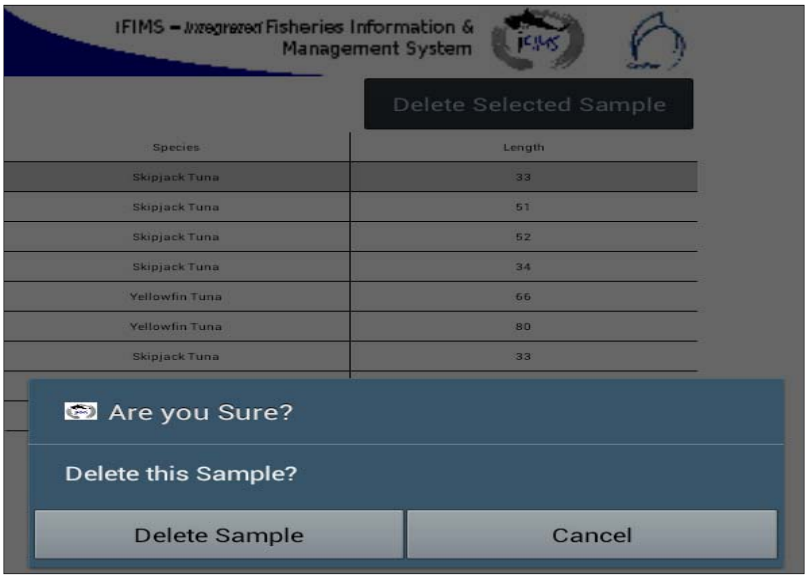
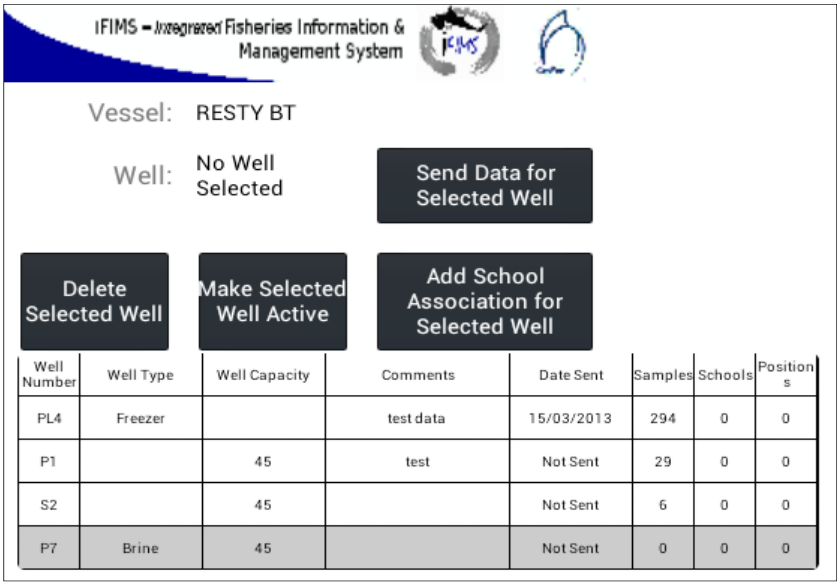


Figure 8: A confirmation reminder before entries are deleted

SENDING DATA TO THE DATABASE

Once information is ready to be sent to the database there are two options, the data can be sent per well that is sampled or all the information for a particular vessel can be sent once sampling is completed. No further changes can be made to the data once it is sent.



Well Number	Well Type	Well Capacity	Comments	Date Sent	Samples	Schools	Positions
PL4	Freezer		test data	15/03/2013	294	0	0
P1		45	test	Not Sent	29	0	0
S2		45		Not Sent	6	0	0
P7	Brine	45		Not Sent	0	0	0

Figure 9: List of wells showing data that has been sent and data yet to be sent and the option to send data for a particular well.

CONCLUSION

The use of port sampling android application allowed data collected to be available close to real time and available for assessment. As data flows straight into the FIMS system, further development in this area will allow the port sampling data to be cross checked and matched with other data sets such as observer and catch logs to be compared and validated to a greater degree.

ACKNOWLEDGEMENTS

We acknowledge the assistance of Quick Access Computing for their work in the development of the e-forms and Android application.

We would like to sincerely thank the port sampling teams in Lae, Madang and Wewak for their enthusiasm and effort to learn, adapt and assist with trials and implementation of the application which was successful in all three ports.