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## Fully Licensed Mobile Data Service Provider Digitally Transforming the Supply Chain by connecting the Container





#### 29 Million Dry Containers have no viable tracking & monitoring



- Only costly M2M type devices
- Roaming costs are too high
- GPS (Satellite) reliance poor battery life
- No Energy Harvesting

## The Solution: IoTPASS<sup>™</sup>





#### Al Based Energy Harvesting Power Management & Carbon Footprint Counter





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#### **Context Aware: Every Key Intermodal Move**



Context Aware Application Control via IoTPASS LTE Cat-M/NB-IoT Modem and Sensor suite

- Preservation and integrity of sensor data via block chain, when the device is outside of Cellular or LoRa coverage.
  - Use Case: An ISO container door switch is activated while on a ship with no Cellular or LoRa coverage. The door switch activation is stored and encrypted on the device. When the device comes back into Cellular or LoRa coverage, the encrypted data is added to the block chain. Customs is then alerted, and the container stopped for inspection.
- Motion Detection via accelerometer.
  - Use Case: Device motion detected by the onboard accelerometer. If the device remains stationary for more than the configurable time, the device is assumed to be stationary and the device is put into a low power sleep state.
- Monitoring Network Load
  - Use Case: The device regularly pings the cellular network to obtain the Signal Quality using the AT+CSQ command. If the response to this command returns a good RSSI value and a Poor BER quality level, the device will assume that the network is overloaded and schedule the transmission of any data once the network load has returned to normal.





ship

## Machine Learning based on RSSI to determine the move on/off vessel (live data from deployed IoT Networks)







- 1. Linear Regression
- 2. Logistic Regression
- 3. K-Nearest Neighbors (K-NN)
- 4. Support Vector Machine (SVM
- 5. Kernel SVM
- 6. Naive Bayes
- 7. Decision Tree Classification
- 8. Random Forest Classification

## Smart and secure energy solutions for future mobility = Energy ECS project





UC1 DroneZones: Autonomous Drone Ecosystem on Mobile platforms <u>UC2 Smart containers in intermodal transport</u> UC3 Smart grid with e-mobility UC4 Vehicle to grid UC5 Self-powered system in tyres UC6 Autonomous driving of EV to charging station

#### IoTPASS



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...metadata from The Box

#### Net Feasa is engaged with the following corporations



Panasonic AVIONICS Matson

Carrier

## SONY

# **YANG MING**

#### YANG MING MARINE TRANSPORT CORP.

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# **Thank You**