Outage Management & Notifications for TNB Smart Meter Customers in Power Distribution Network

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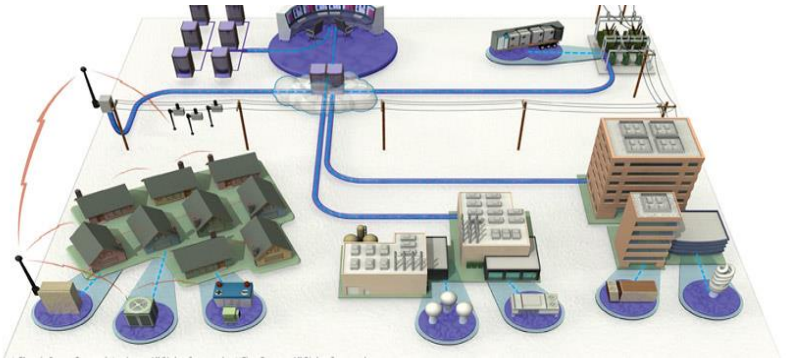
ICLAD 2019



Agenda

- Introduction to TNB AMI Project
- AMI high level architecture
- AMI functionalities to be implemented
- Legacy vs AMI Outage Management Process
- Design of AMI Outage Management & Notification Process
- Gaps in AMI Outage Management & Notification Design
- Conclusion

TNB AMI Project – The Roadmap

TNB is embarking on a nationwide implementation of Advanced Metering Infrastructure (AMI) for 8.5 million customers in Peninsular Malaysia . Smart meter roll-out in the state of Melaka for ordinary power customers started in January 2018 and expected to be completed by December 2019.

PILOT

Pilot Smart Meter Project implemented in Melaka & Putrajaya (1000 smart meters)

2014-2016

Evaluation phase on technologies, partners, processes and risks mitigation before embarking on the nationwide roll-out

1st PHASE

Smart Meter roll-out for the state of Melaka

2016-2019

300,000 meters

2nd PHASE

Selected areas in Kuala Lumpur, Selangor, Putrajaya and Cyberjaya

2019-2020

1.2 million

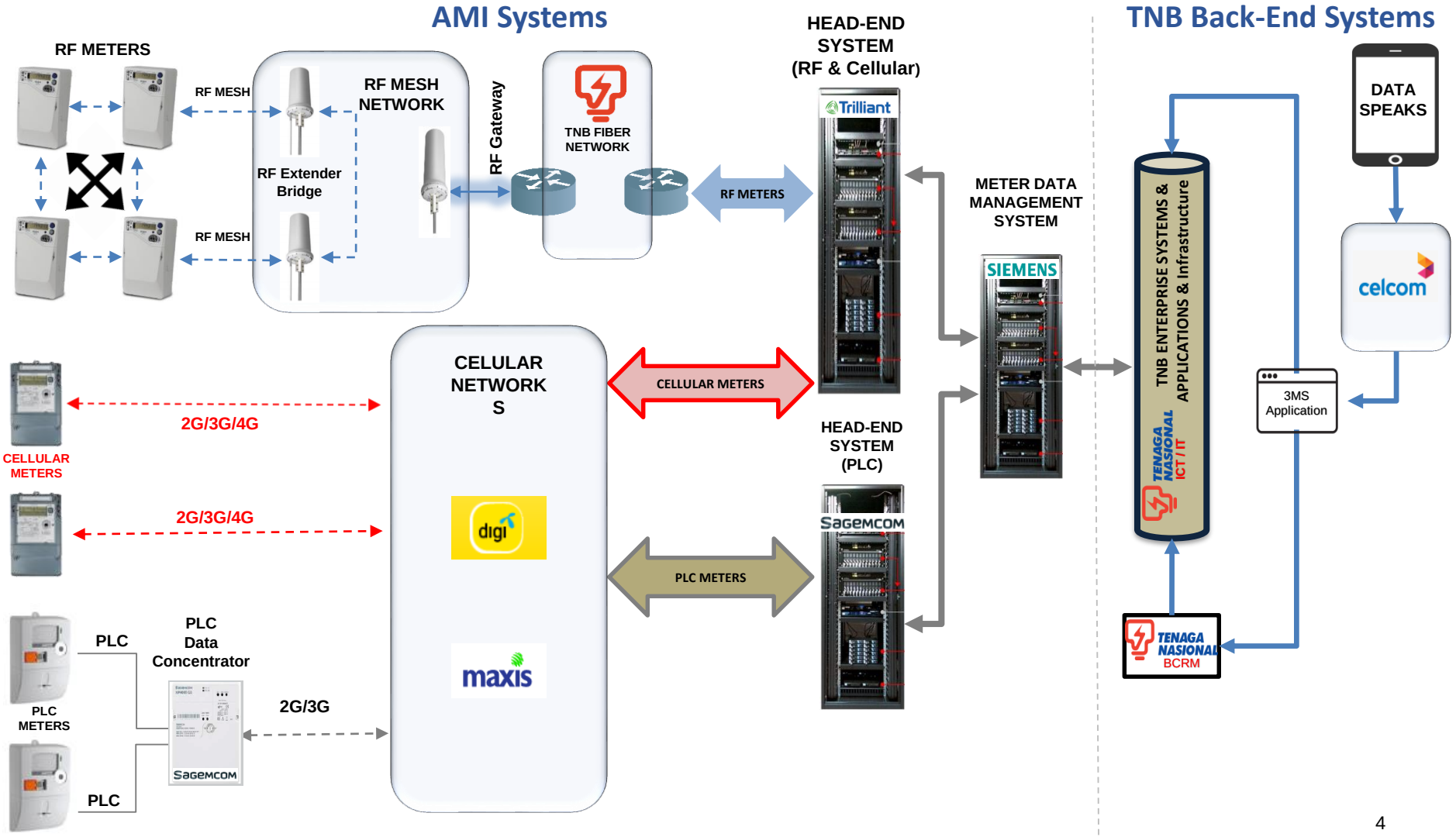
Nationwide

2021 onwards

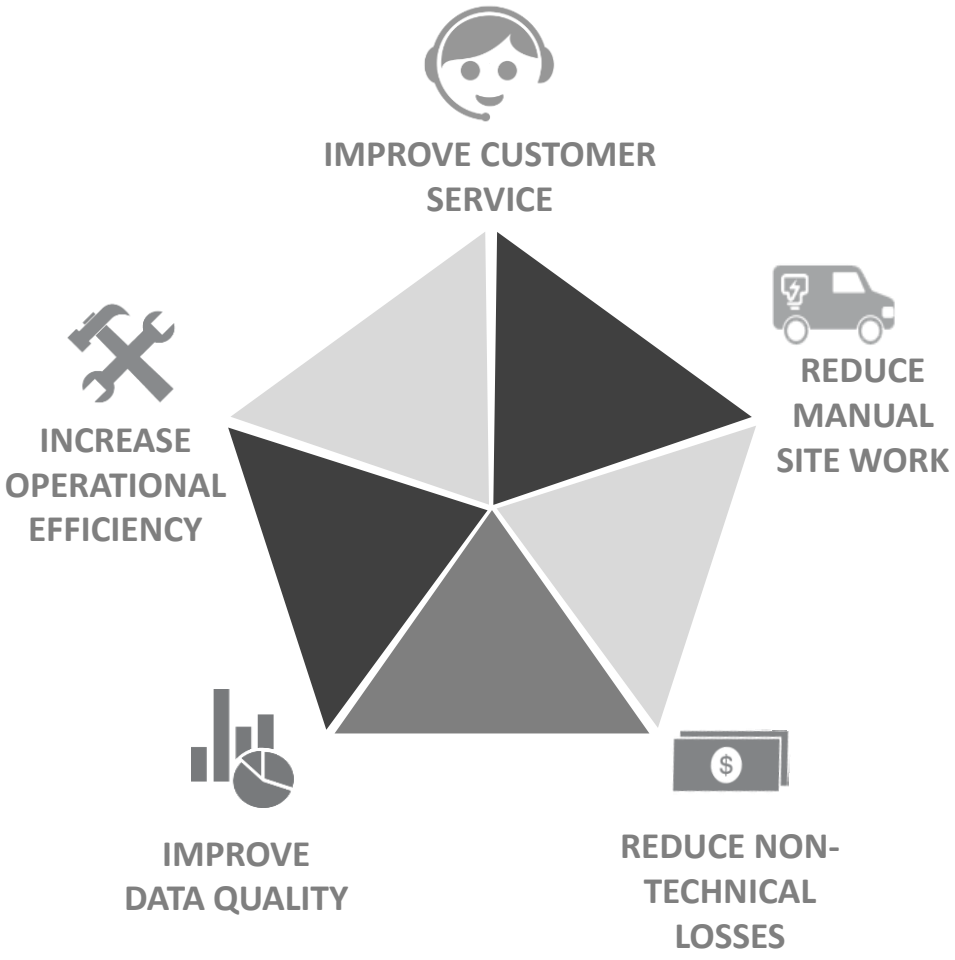
7.5 million meters

Regulatory Period 2	Year 1	Year 2	Year 3	Total
Deployment year	2018	2019	2020	
Approved number of Smart Meter Installation by Energy Commission	300,000 meters	400,000 meters	800,000 meters	1.5 mil meters

AMI High Level Architecture



AMI Functionalities To Be Realized

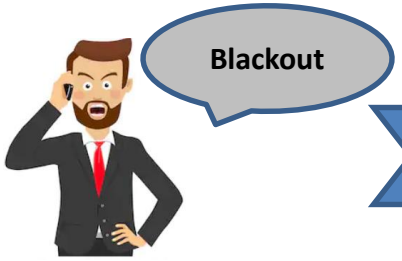


Main Business Features

1. Equipment Management
2. Contract Management
3. Supply Automation
4. Auto Meter Reading
5. Auto-Billing
6. Renewable Integration
7. Power Quality
8. Non-Technical Losses
9. Time-of-Use Billing
10. Customer Care
11. Outage Management & Notification
12. Smart Payment
13. Demand Response

Legacy vs AMI Outage Management

Legacy Process



Careline receiving complaint & create outage ticket to Supply Management Team (Field Crew)

Field Crew repair & restore supply

AMI Process

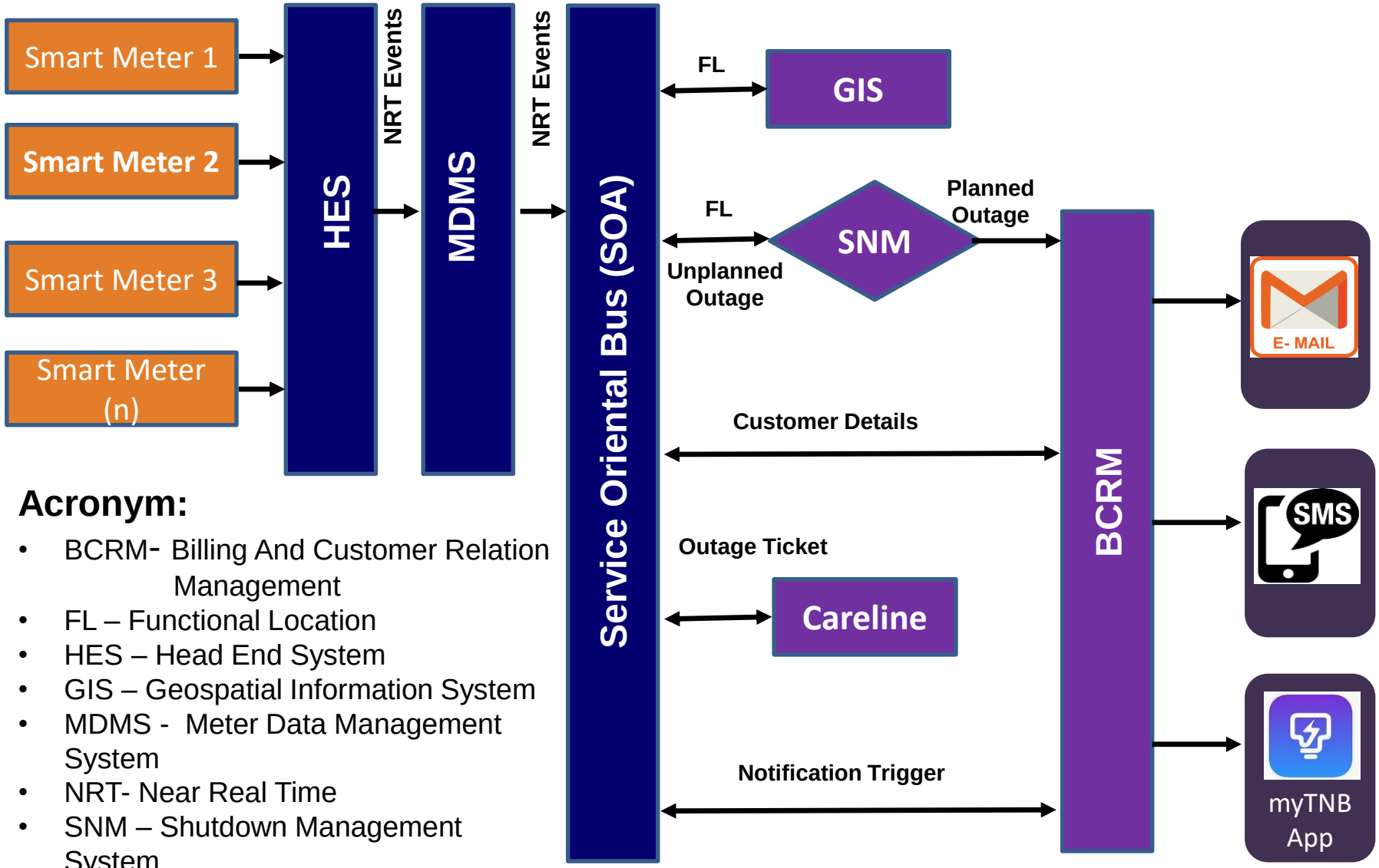
Meter sends 'Last Gasp' alarm during outages

Customer Notifications:
E-mail, SMS & myTNB app

Outage ticket created automatically to Supply Management Team (Field Crew)

Field Crew repair & restore supply

Overview Design of Planned & Unplanned Outage



Acronym:

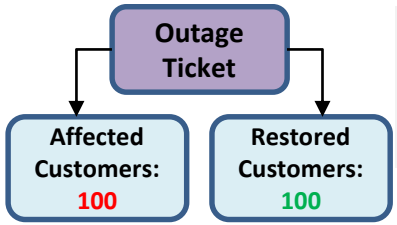
- BCRM- Billing And Customer Relation Management
- FL – Functional Location
- HES – Head End System
- GIS – Geospatial Information System
- MDMS - Meter Data Management System
- NRT- Near Real Time
- SNM – Shutdown Management System

Meter Ping

- Meter Ping is a communication tool used to assist in determining the power supply status of the customer's premise.

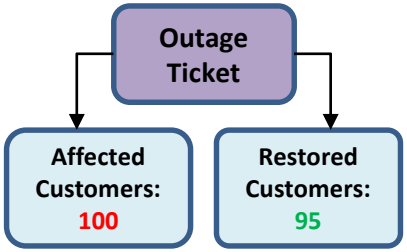
Scenarios of Meter Ping

Case 1



CMC Operator initiates the Meter Ping from CMC UI using Meter ID for any of the restored customers randomly

Case 2



CMC Operator initiates the Meter Ping from CMC UI using Meter ID for any of the non-restored customers randomly

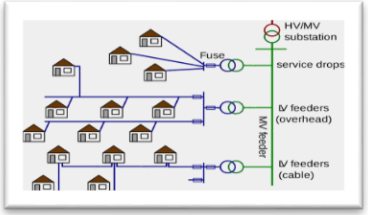
Case 3

CMC Operator initiates the Meter Ping from CMC UI using Meter ID for any of the restored customers based on the customer call, when the customer is still reporting outage when the power is restored.

Case 4

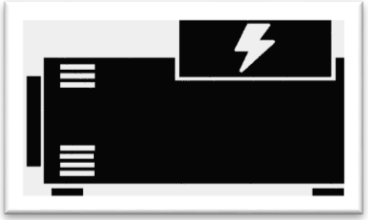
CMC Operator has an option to initiate the Meter Ping from CMC UI / BCRM using Meter ID, CA No when any random customer calls and reports an outage.

GAPS from Outage Management process, affecting TNB Customer Experience



LV Network Changes

Issue: If there is LV Network changes at site & technician fail to update the network in system, customers fail to receive the Planned Notifications as SNM is using Functional Location (FL) to send out the notifications from BCRM.



Multiple False Notifications

Issue: If the supply is restored by using Generaor/LV Ring, customer receive multiple outage & restoration notifications as Smart Meter would not be able to differentiate the source of supply.

Characteristics of RF Mesh Network

Issue: Customers fail to get outage notifications when Smart Meter 'Last Gasp' fail to reach HES due to the shorter effective communications distance. Furthermore, the information will hop from one meter to another meter resulting more interference.

Unavailability of Last Gasp in PLC Smart Meter

Issue: Customers installed with PLC Smart Meter will not get notified if outages happen because 'Last Gasp' feature for PLC Smart Meters is not available

Conclusion

- AMI is transforming outage management to be better for utility and customers

- Well designed Outage process considering the gaps identified will enhance TNB customer experience.


Thank you