

GE
SMART
ASIA 2018



Locate
#Locate18



WHEN

9 – 11 APRIL 2018

WHERE

ADELAIDE, AUSTRALIA

[CLICK HERE TO KNOW MORE](#)

GIS in Smart Grid

UNIVERSITI TENAGA NASIONAL **(National Energy University)**



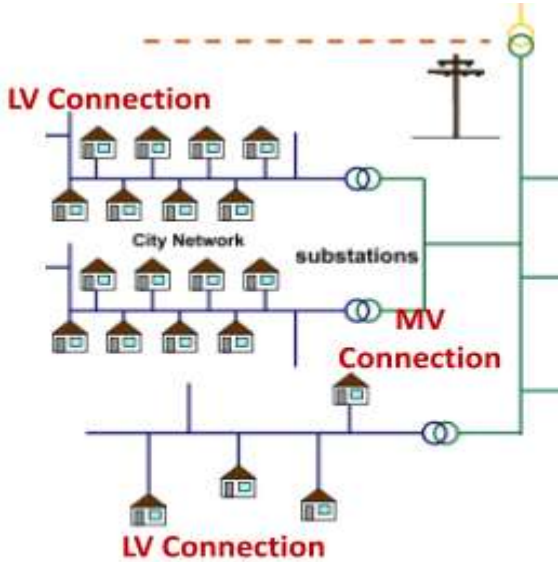
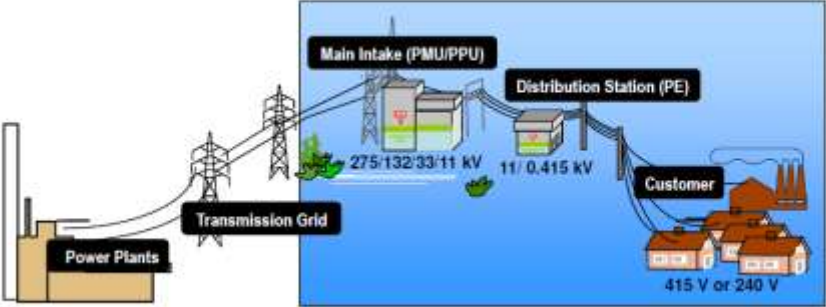
**Private University Wholly Owned by
TENAGA NASIONAL BERHAD (TNB),
The largest electricity utility company in Malaysia**

Physical Facilities...

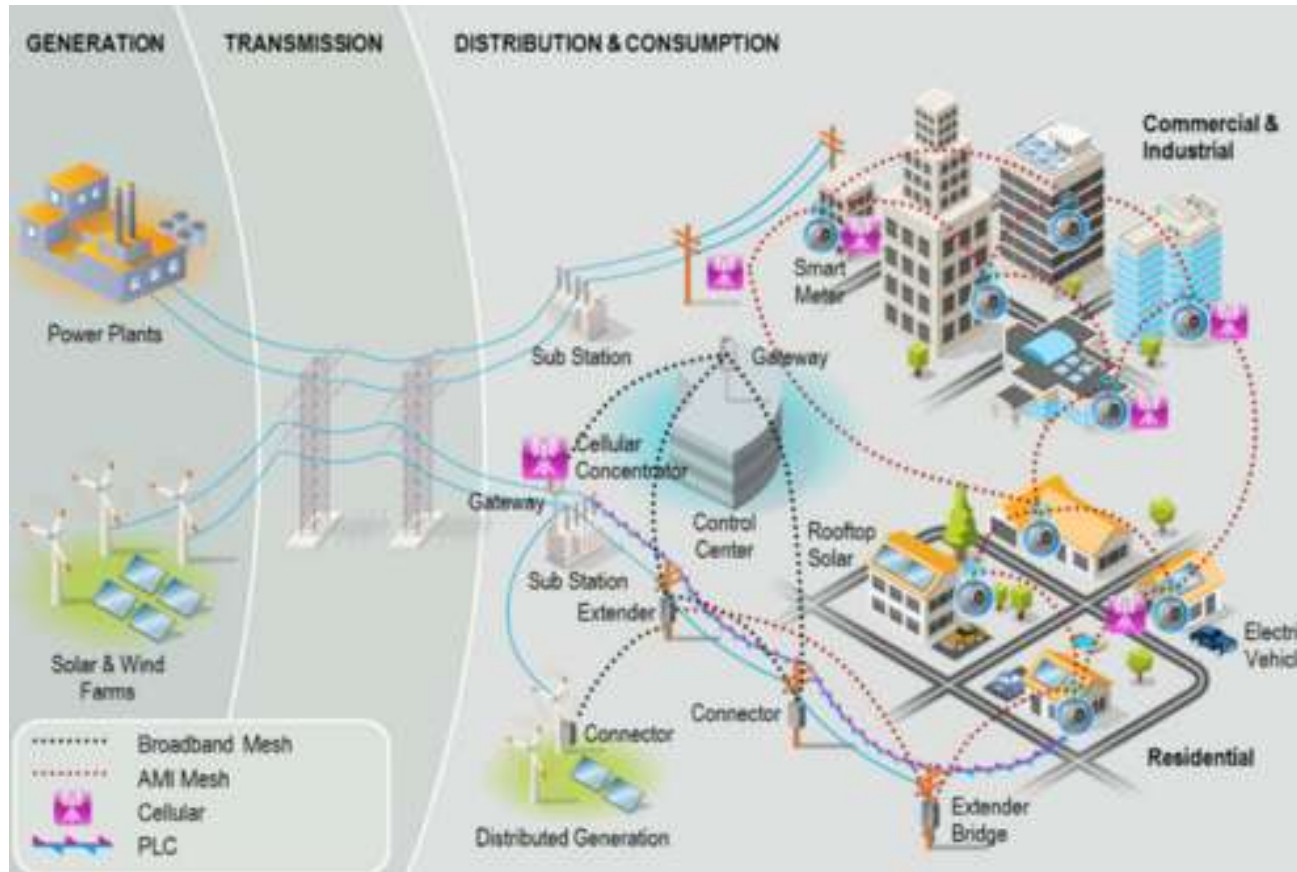


Electricity Delivery Network

GRID SYSTEM IN PENINSULAR MALAYSIA



Smart Grid



Smart = C^2

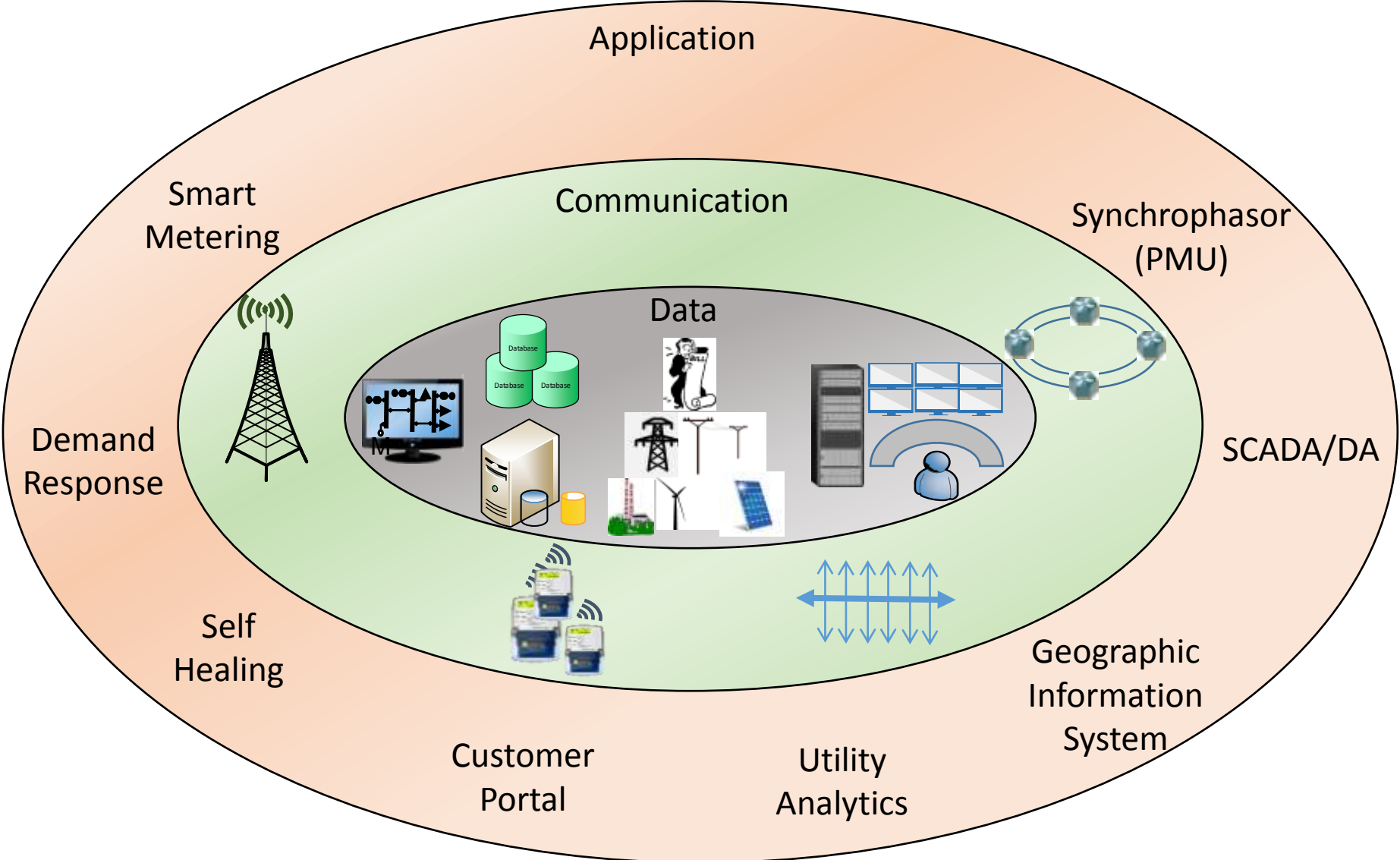
Where

C^2

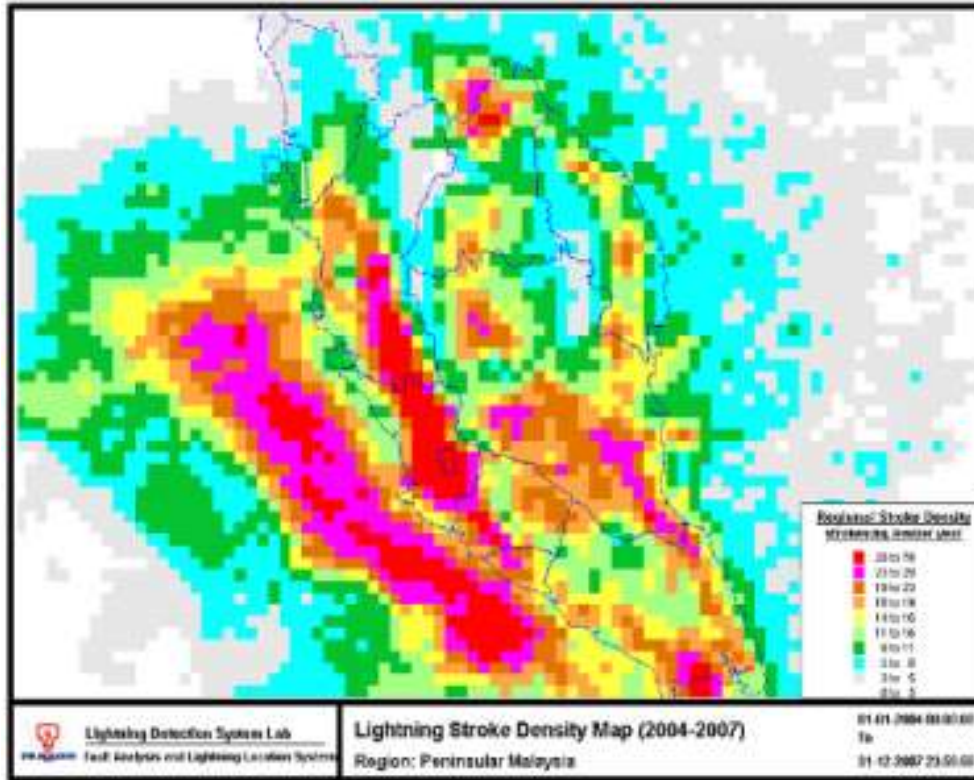
- Computing
- 2-ways Communication

[Situational Awareness]

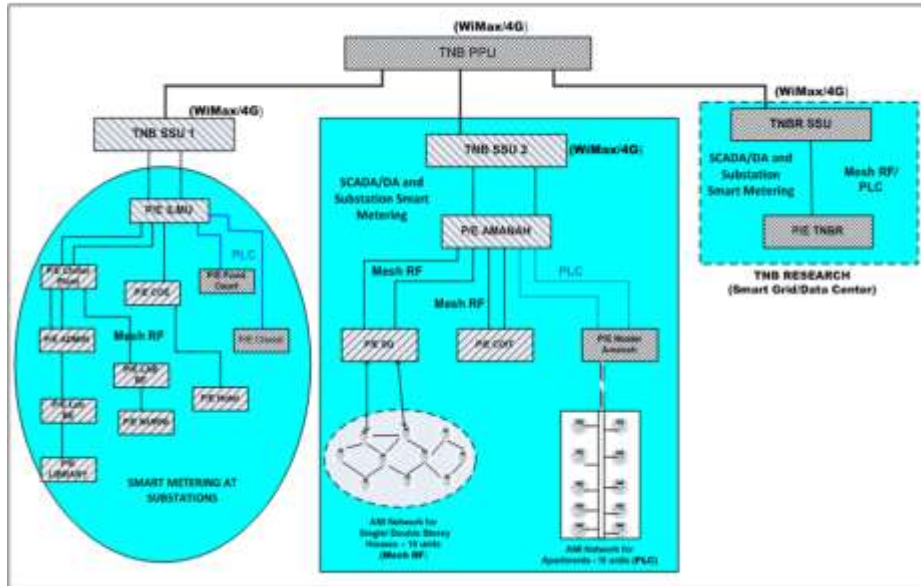
Smart Grid Vision



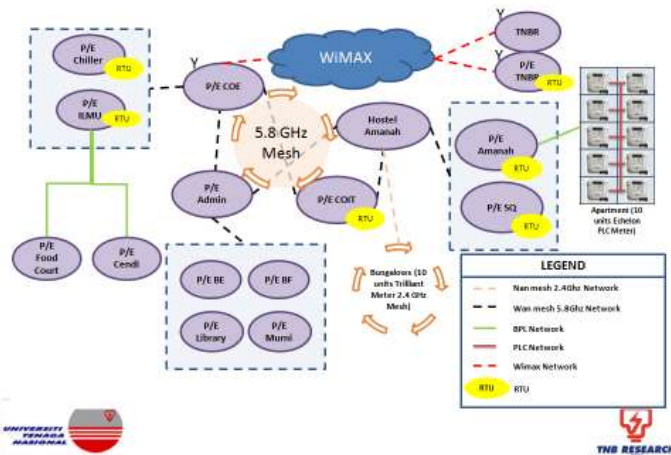
In the beginning...



Smart Grid Test Bed @ Uniten



Smart Grid Network Diagram



Funding: TNB

Location: TNBR and UNITEN campuses

Focus on utility Communication

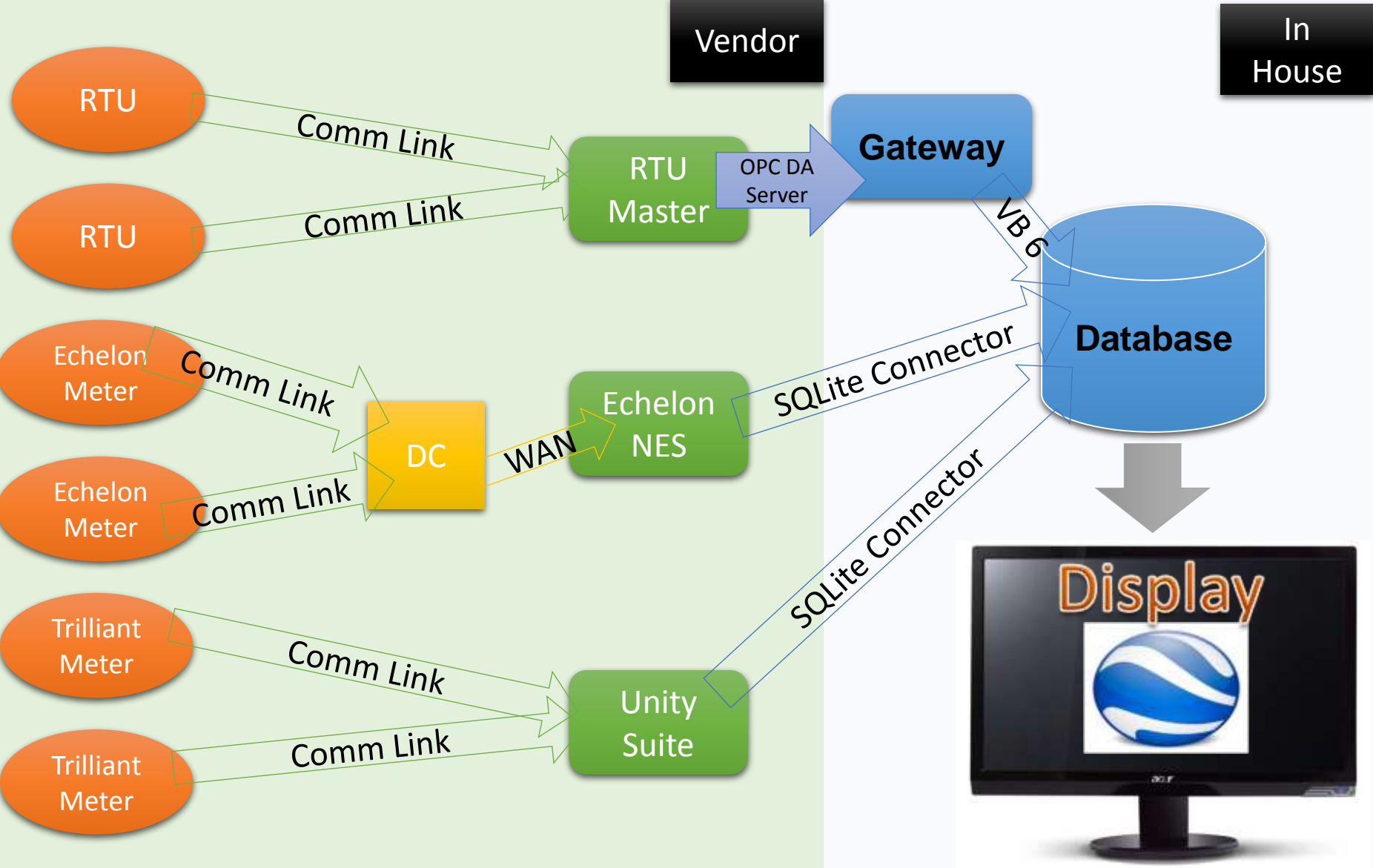
- Meshed RF (WAN & NAN)
- PLC: Narrowband & Broadband
- Wimax

Application:

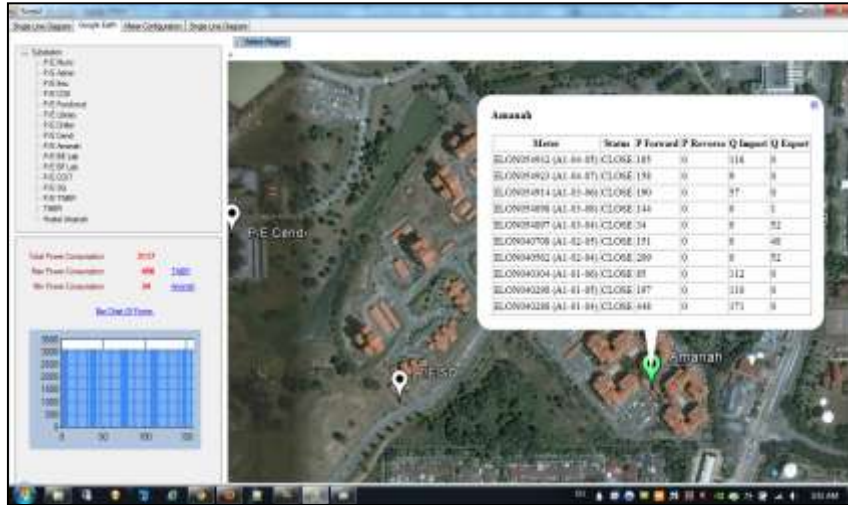
- AMI
- Substation Metering (CT Meter)
- SCADA/DA



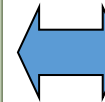
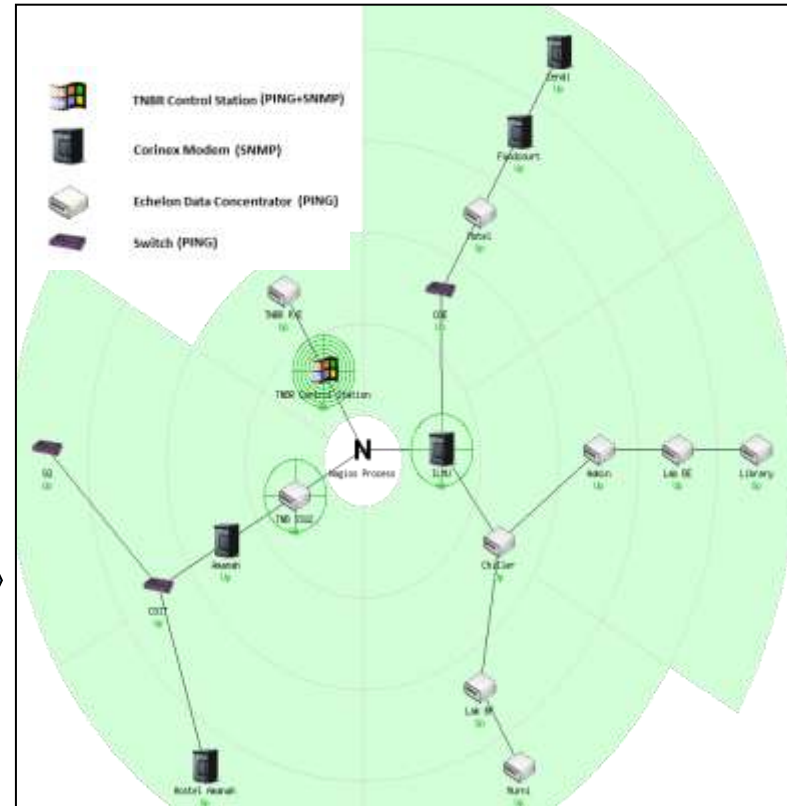
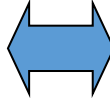
Information Flow Architecture (System Integration & Software Development)



GIS Based Display System



← Data Polling & Display (developed)

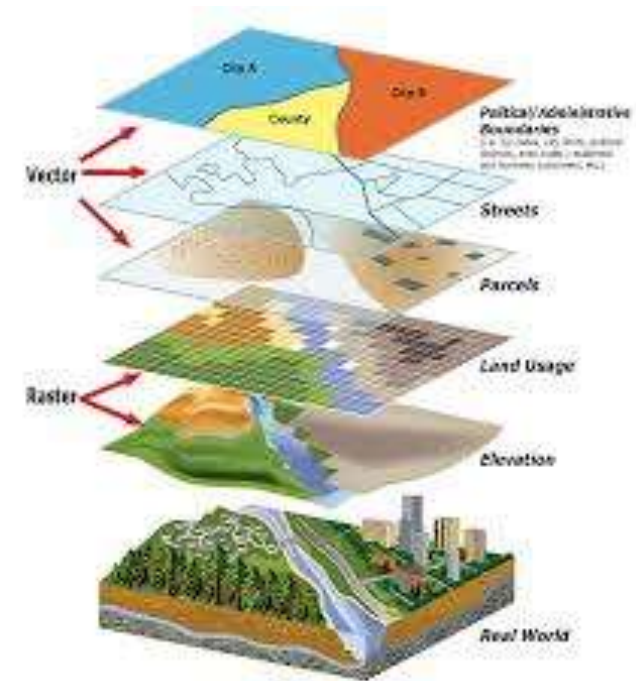
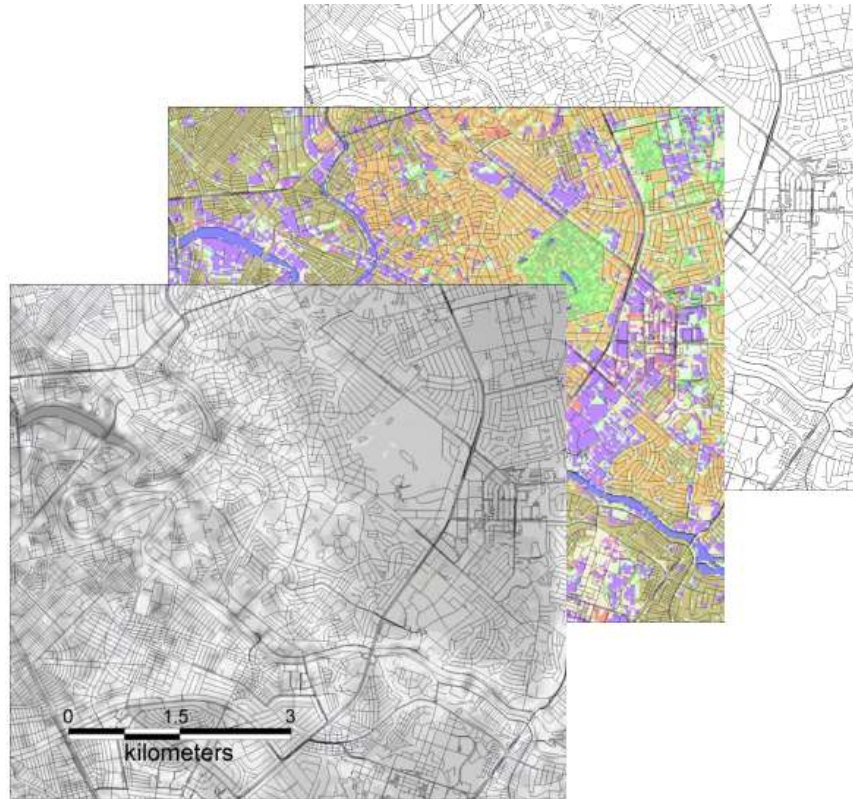


Network Management Software (developed)

RF Planning

Ultra High Dense Urban area

- Detailed Geography Data
 - Street Layer Data
 - Clutter Layer Data
 - Terrain Layer Data

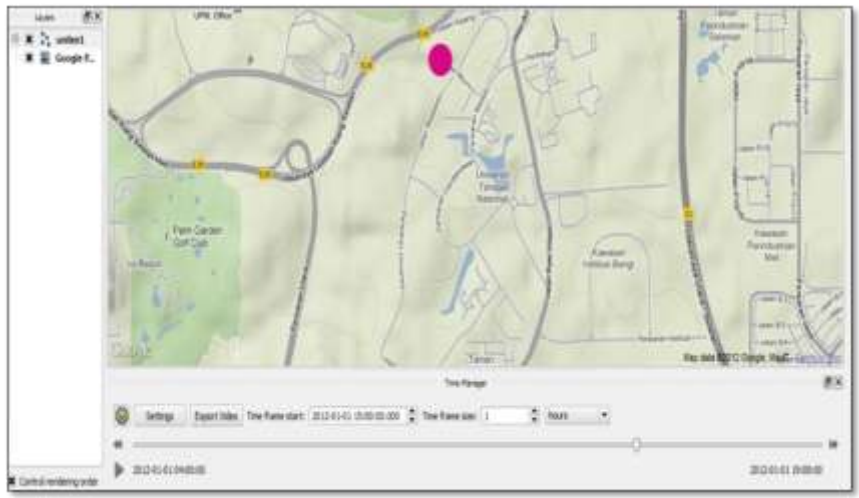


Thank Goodness for the multiple Layers

GIS as Visual Analytics

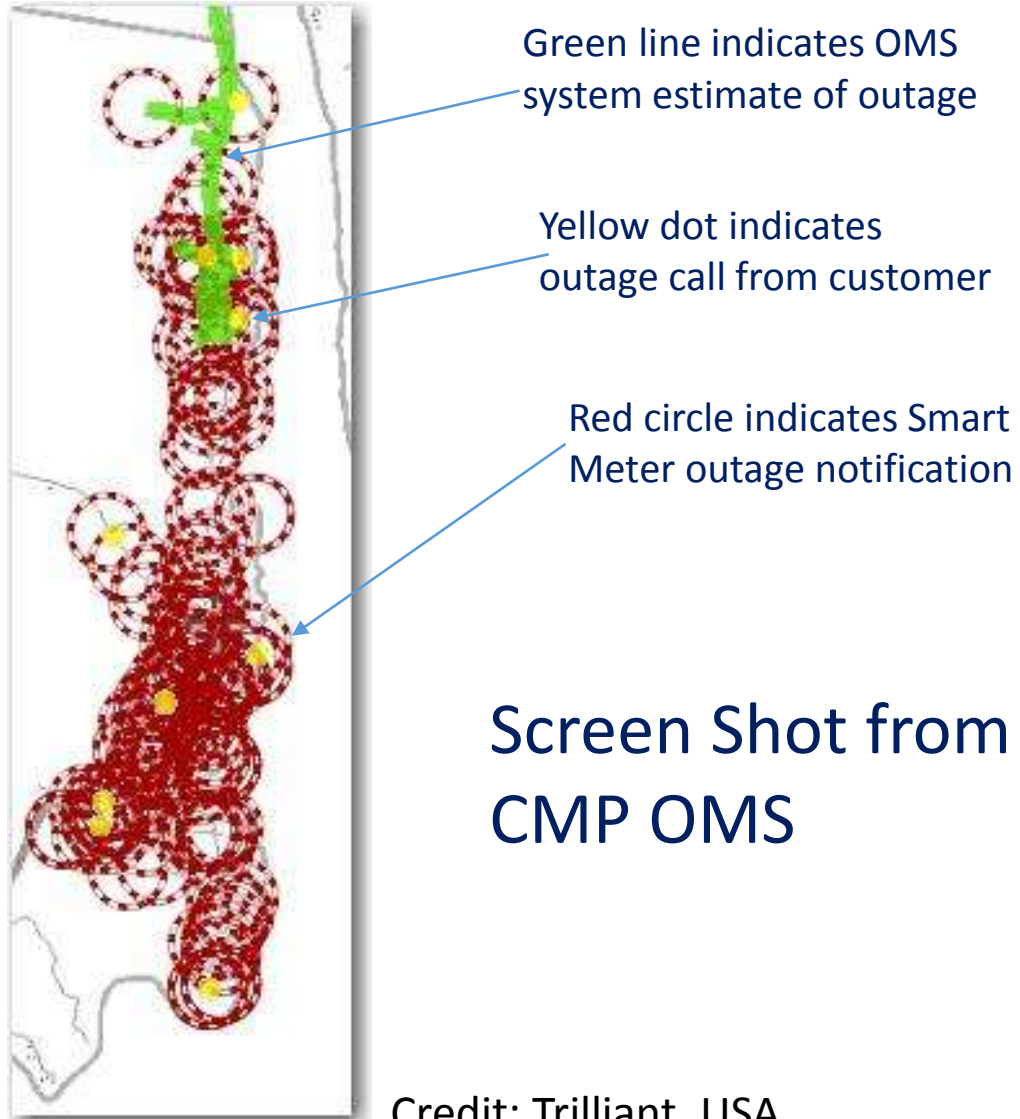


Red: PLC
Yellow: RF Mesh

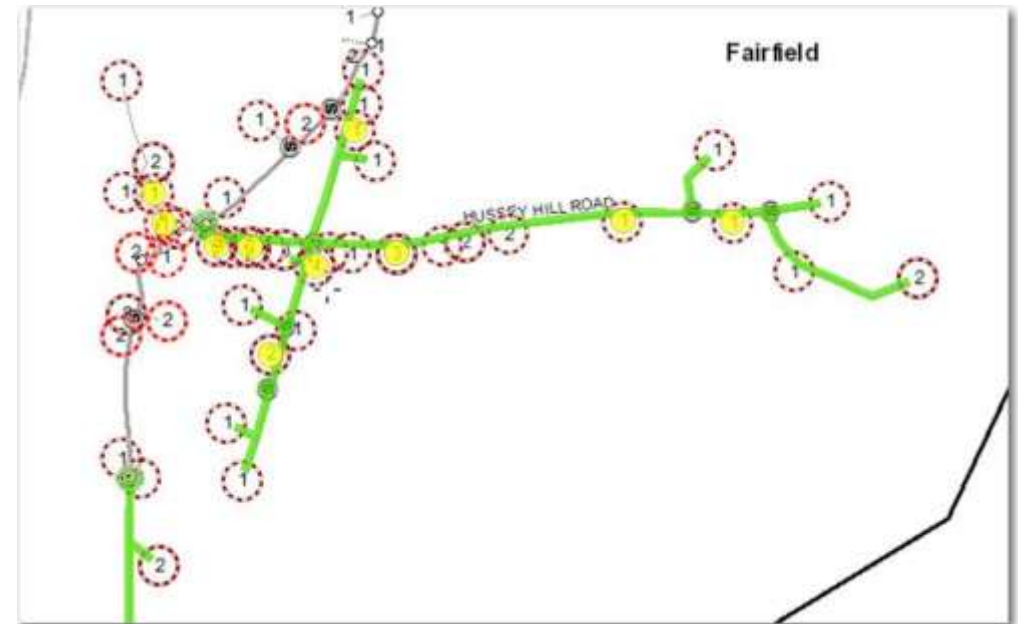


Audio and Video Animation

Outage Management



- **AMI system shows two OMS estimated outages are connected**



Land Slide Monitoring

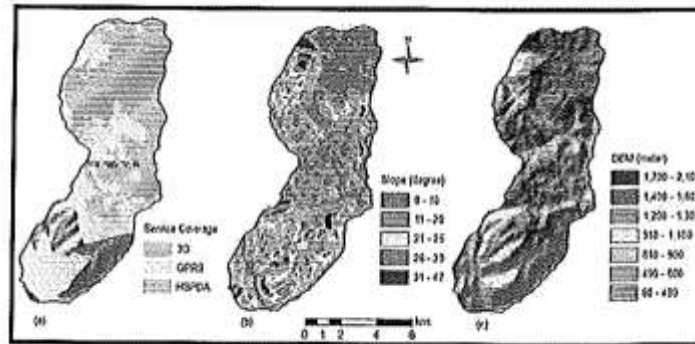
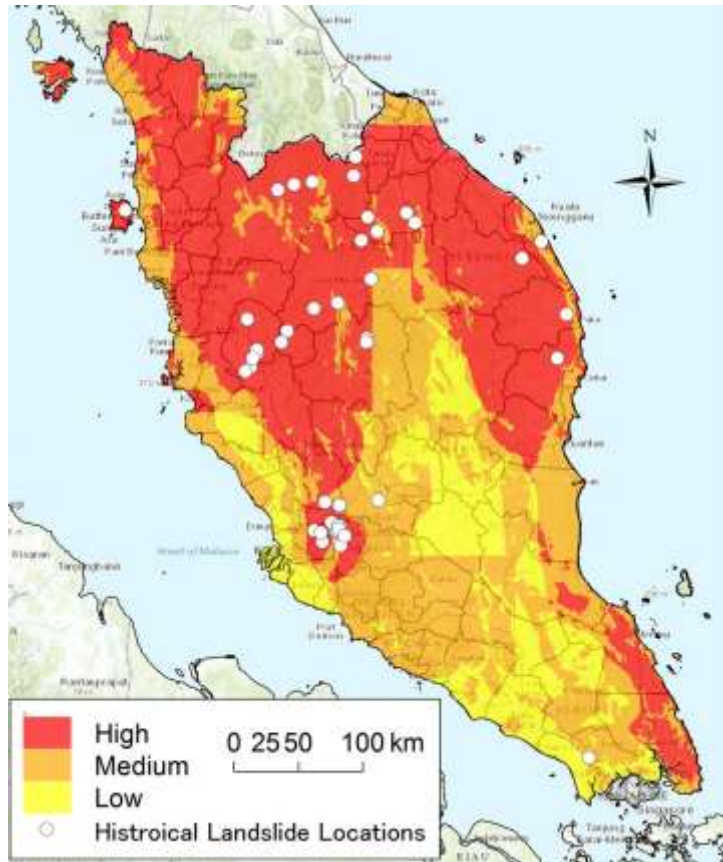
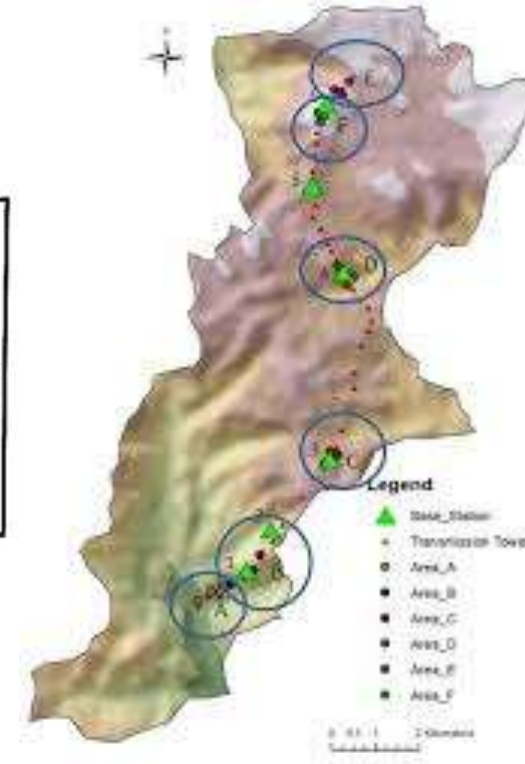
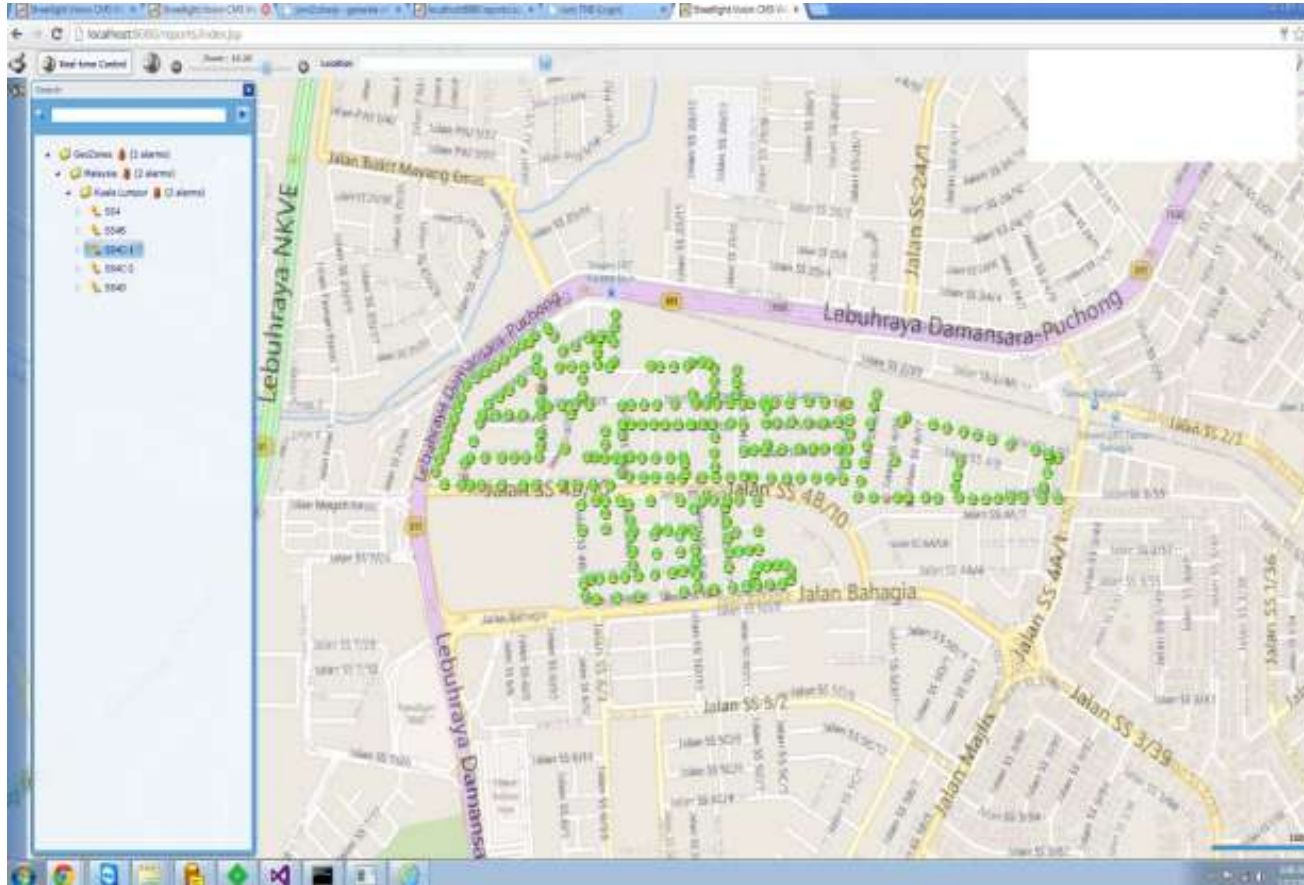


Fig. 4 Criteria map; (a) Service Coverage Map; (b) Slope Map; (c) DEM Map

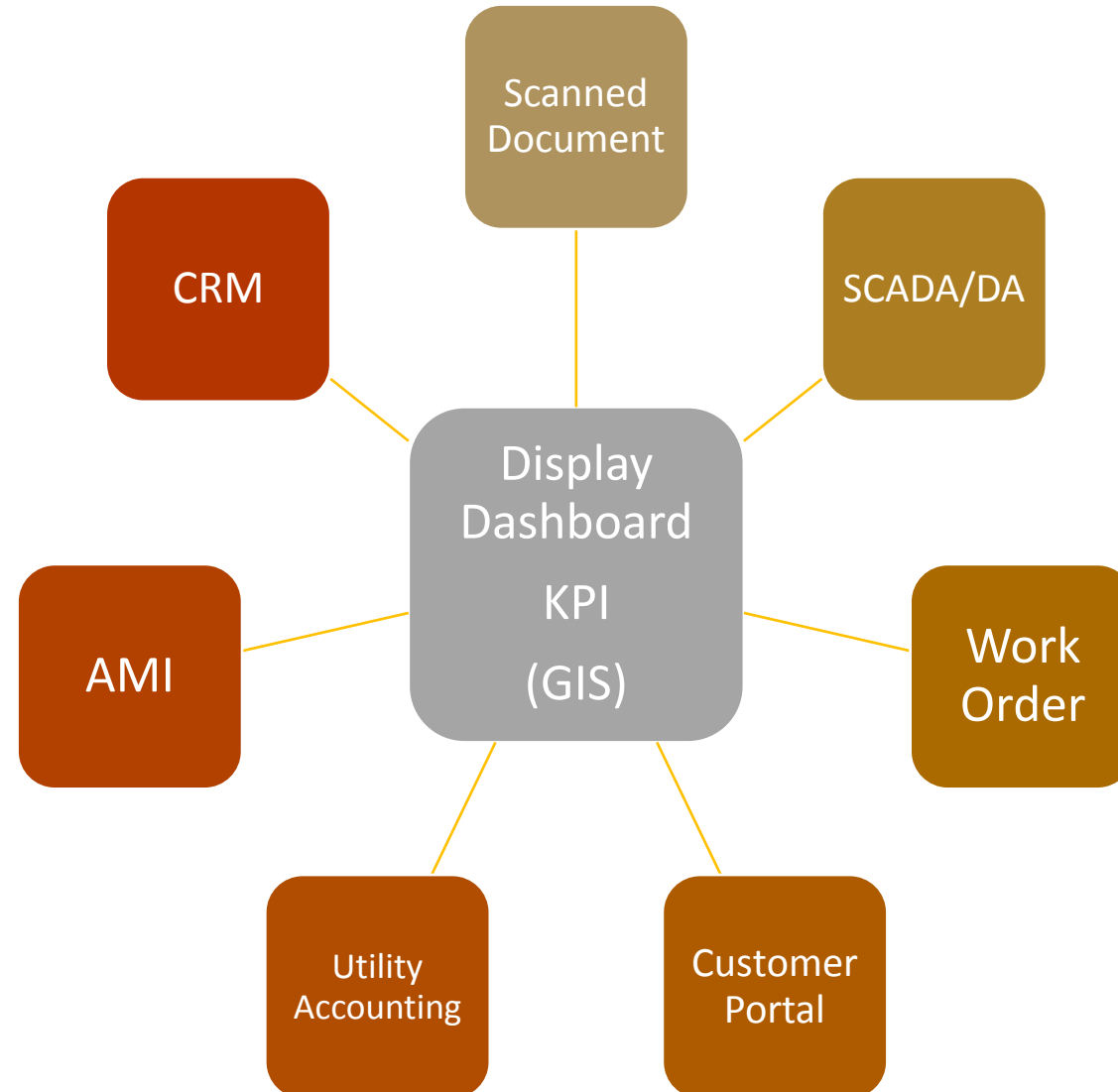


Asset Management and Work Force Automation



Street Light Automation at Kelana Jaya, TOMS, FFA

Point of Integration



Data, Data in the Base



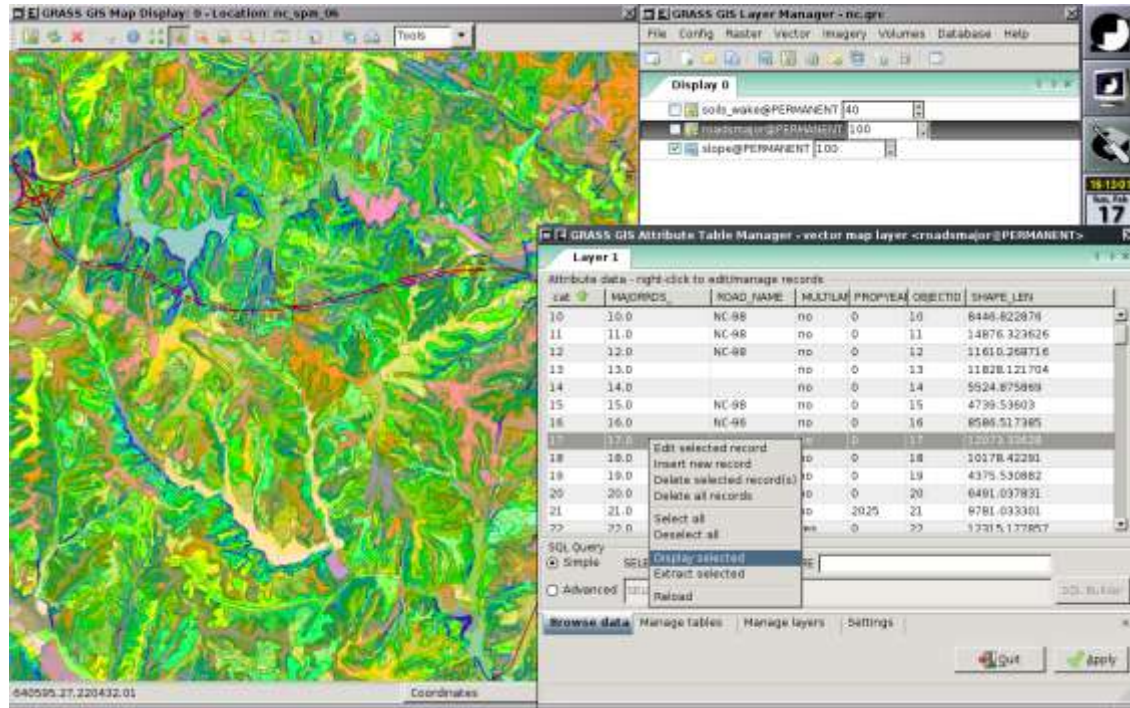
La GIGO

- Data availability
- Data Integrity
 - Virtual-Physical Mismatch
- Consistency of Data Model

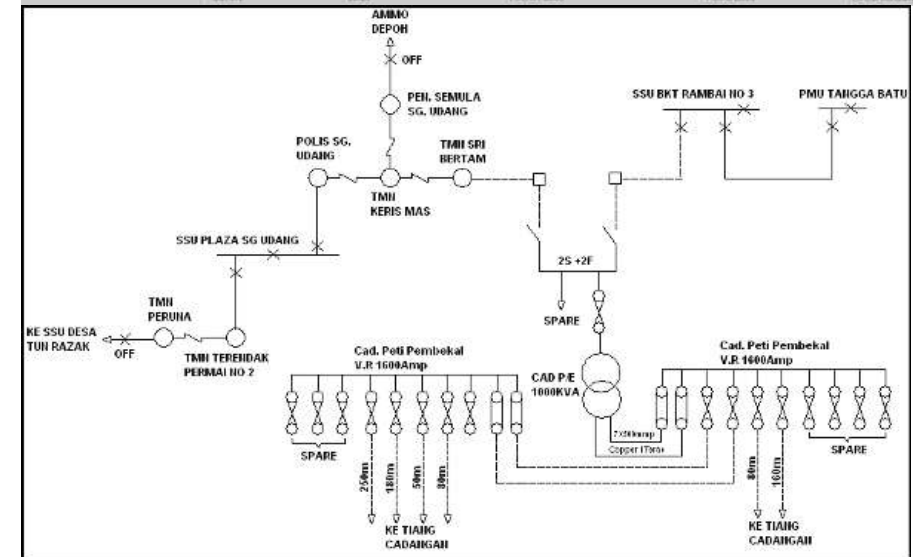
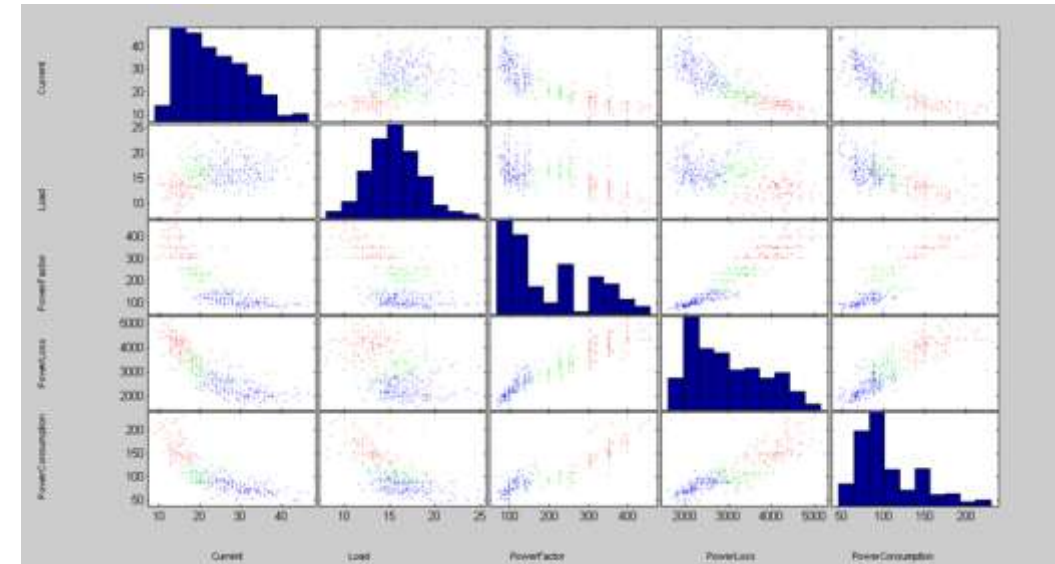
Secure?

IEC 61970
CIM

Challenge: Usable?



Versus





Q & A