

EPRI DATA ANALYTICS CASE

Development of Electrical Load Model Utilizing SCADA and AMI Data

The Data Challenge

Most electric utilities are challenged by the accuracy of the models of loads in their electrical distribution system because most are constrained by the information contained in the customer information system (CIS) and what is reported as a “connected load.” The accuracy of this information may not be sufficient to conduct an accurate load-flow analysis to allow engineers to plan and manage the operation of the distribution network.

Solution Overview

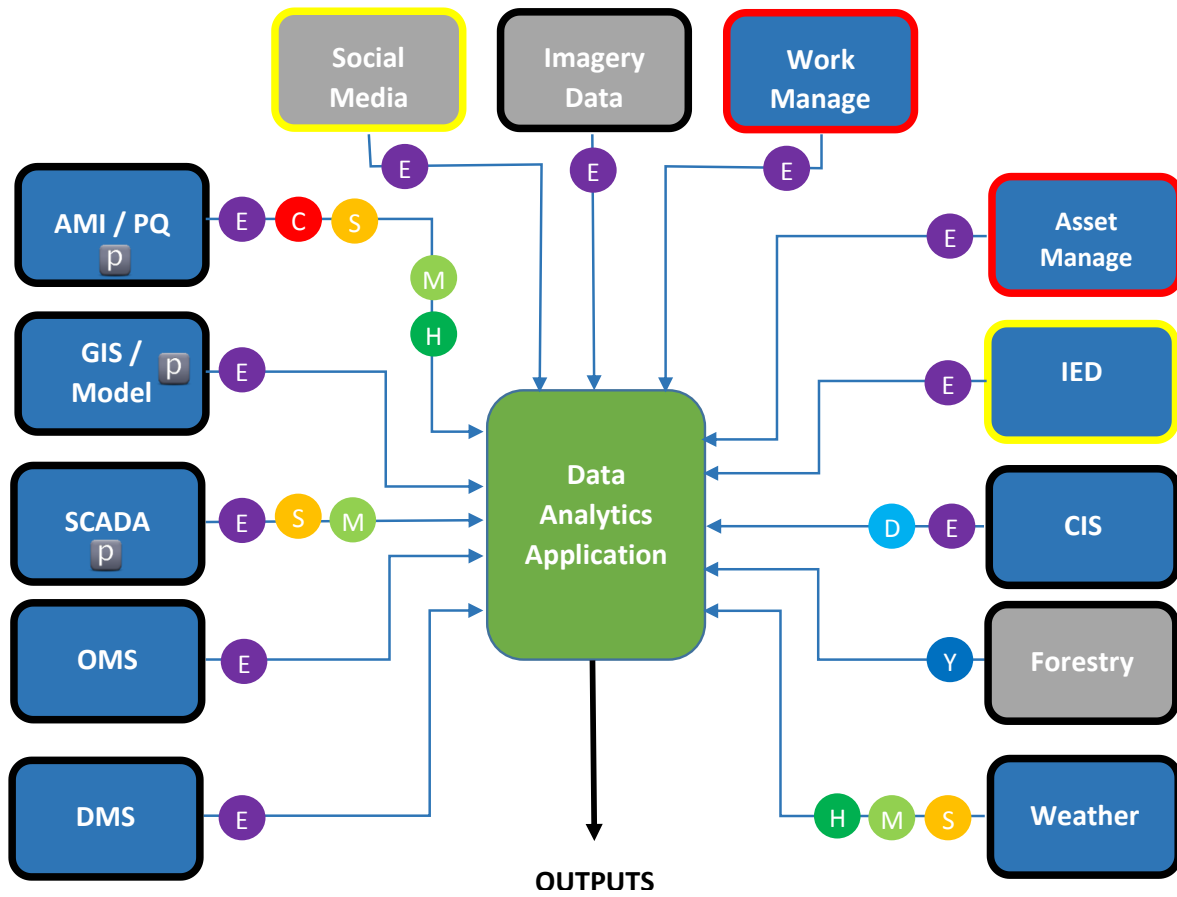
By leveraging aggregated data sets from numerous sources—primarily from meters in an advanced metering infrastructure (AMI) and supervisory control and data acquisition (SCADA)—a more precise electrical load model and load-flow analysis may be developed and geographically presented to the utility distribution operators and engineers to allow for a more refined approach toward real-time operation of the distribution system and in support of system planning.

Potential Methods for Solving the Problem

Utilizing aggregated data from the AMI meter network along with data from SCADA and other distributed intelligent devices from the distribution system, a graphical layer to the utility geospatial information system (GIS) is developed providing for near-real-time load-flow data. An operator or engineer may query any node or branch at any time to aid in identifying a potential cause. Operators will also be presented with, for example, a set of tools that will allow them to “test” switching scenarios and other changes to the system to produce a result that they can then evaluate further before executing the actual switching order. Performance metrics for each node may also be presented to the operator to allow for a deeper understanding of conditions. This may also include historical data for each node and branch in addition to other shorter windows in time. In addition to the graphical output, tabular reports may be generated.

Available Data Sets

The data sets highlighted in the following figure are available in the EPRI Data Repository to solve this data analytics case.



Classifications of Data:

- Traditional Data Set
- New Data Set
- Structured Data
- Un-structured Data
- Format of Data Varies

p Denotes a primary data set used to solve this data analytics case.

Frequency of Measurement

- C Cycles
- S Seconds
- M Minutes
- H Hours
- D Days
- Y Months to Years
- E Event Driven