Smart Grids | Renewables integration | Energy Management

Big Data Analytics for Optimal Energy Management

Issue

Conventional power grids are facing many challenges to respond to the continuous growing demand for electricity and to deal with the increased penetration of intermittent renewable energies, as well as to be more reliable, stable, and efficient. These diverse challenges are the forcing drivers to the transformation of the current grid into a Smart Grid (SG). SG is supported by a large number of smart meters, sensors, detectors, measurement units, etc. Those elements provide a continuous stream of data to support system performance. The large amount of data obtained from different SG sources satisfy all the Big Data "4-V" features: Volume, Velocity, Variety and Value. The final success of this new model for the electricity sector depends largely on the effective utilisation of the big data flow generated by the Smart Grid.

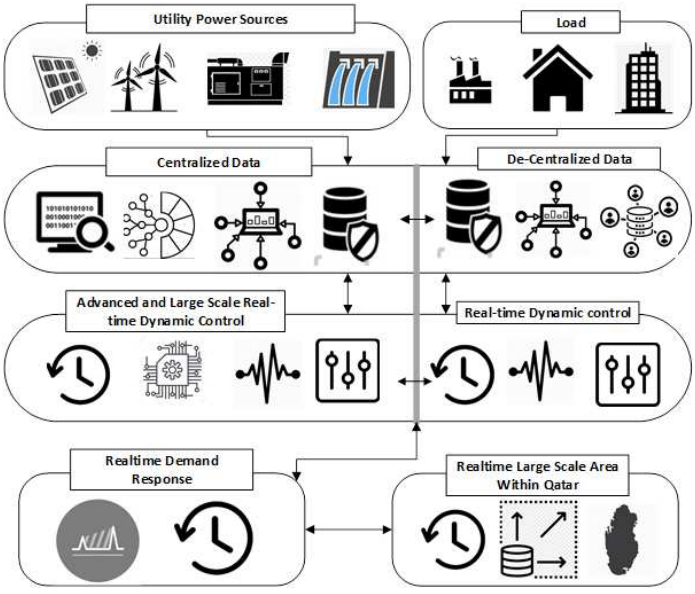
Solution

Iberdrola Innovation ME has teamed up with Texas A&M University to make a sizable contribution to this technology challenge. The Big Data Analytics for Energy Management project is aimed to provide a smart management and dynamic control system for SGs while utilising the advantages of the big data information flows. After an initial assessment of the applicability of the different Big Data platforms currently available to the problem at hand, the research team will focus on the development of applications aiming at a better management of the energy balance in electrical networks, such as:

Energy Resources Management: identifying, matching, allocating, scheduling, and monitoring energy resources over time, balancing the availability of these resources with varying levels of electricity demand, optimises SG assets, and makes them operate efficiently and reliably;

Direct Load Management; controlling and managing the demand in order to shape the load profile for optimal energy consumption.

The data is collected and using specialised software, the efficiency of the system can be achieved without negatively affecting the end user.



Impact

The outcomes of the project will allow optimising the investment in SG equipment by improving the allocation of energy resources and automating the response of the system using continuous data-based feedback. The applications developed will be suited to Qatar needs but will respond to the demands of the global market.

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