Enterprise Analytics for SCE's Distribution Planning

January 28-30, 2020 • #DTECH2020

Speaker: Vidyod Mavilavalappil

Enterprise Information Architect, SCE, <u>Vidyod.Mavilavalappil@sce.com</u>

Co-Author: Shawn Hu

STRIBUTECN

NTERNATIONA

• Solution Architect, Xtensible Solutions, shu@xtensible.net

Co-Author: Greg Robinson

Managing Director, Xtensible Solutions, grobinson@xtensible.net

Session: How Utilities are Using Advanced Data Analytics and Modeling Tools for Innovative Solutions Session Chair: Hahn Tram | Session Co-Chair: Josh Wepman 30 January 2020 - 08:45 - 10:15



118,000 miles of transmission and distribution lines

46% carbon-free electric supply (2017 numbers)



Southern California Edison

15 million residents

4,600+ circuits

Most US energy storage installation for past 2 years

50,000 square mile service area

a leader in solar in USsince 2007 "Climate change is the defining issue of our time—and we are at a defining moment."

> Antonio Guterres United Nations Secretary General

By 2045, California is committed to carbon neutrality across all sectors of its economy and 100% decarbonization of its retail electric supply

Pathway 2045 is Southern California Edison's roadmap to carbon neutrality. (edison.com/pathway2045)

Overview

Use Case

The Role of analytics in modernizing SCE's system planning and integration of DER in utilities distribution system

What I am going to talk about?

How we architected and modelled various IT systems to implement this use case

f



January 28-30, 2020 • #DTECH2020



According to a Forbes survey, data scientists spend almost 80% of their time on data preparation !!



Source: https://www.forbes.com/sites/gilpress/2016/03/23/data-preparation-most-timeconsuming-least-enjoyable-data-science-task-survey-says/

January 28-30, 2020 • #DTECH2020

A



Use Case details

Use Case

The Role of analytics in modernizing SCE's system planning and integration of DER in utilities distribution system





January 28-30, 2020 • #DTECH2020 🛛 🗗 🕑 🛅 🎯

Let's talk about the data !



The De Start

Spread across the enterprise, some of the data sources does not exist !



Most of the data is not connected or never correlated



January 28-30, 2020 • #DTECH2020 💮 🕑 🛅

Let's talk about the data !



- All assets are not maintained and managed in one single system (linear, Non-linear assets, Customer owned assets, DER Assets etc.)
- Information mismatch between systems
- Asset operational information are maintained in proprietary format
- Different view of connectivity across different departments

January 28-30, 2020 • #DTECH2020 🛛 🚯 🐨 🖸



Business Architecture- Functions and Capabilities

STEP 1 : <u>Understanding</u> <u>business needs</u>

- Business Capabilities
- Functions
- Interdependencies

Both business and IT is talking about same thing !!





Business Capabilities-Application – Data- Technology



f

Business Capabilities-Application – Data- Technology

January 28-30, 2020 • #DTECH2020 ERNATIONA

Deep dive into data preparation – Understanding challenges





January 28-30, 2020 • #DTECH2020 f 오 🛅 🎯

Data management strategy





Common Information Model

- SCE's Common Information Model (SCIM), which is in UML notation
- Based on IEC Common Information Model (CIM)
- Used for both 'data-in-motion' and 'data-at-rest'



Unified data model, integrating data from desperate sources to provide, endend view of data



January 28-30, 2020 • #DTECH2020 🛛 🕤 🕼 🌘



INTERNATIONA

January 28-30, 2020 • #DTECH2020 🕧 🕑

SCIM for DER (attributes hidden)

E BAR





January 28-30, 2020 • #DTECH2020 🚯 🖸 🕼



Data quality framework



System context



Concluding Remarks

- 1. Think end-end
- 2. Data preparation is the key step
- 3. Identify data quality issues, early in the project life cycle
- 4. Get sponsorship for fixing data quality issues
- 5. Using operational data for planning, is challenging
- 6. Do careful selection of technology
- 7. There is no single technology or packaged application which can meet all the needs
- 8. Follow CRISP-DM model for algorithm development

