Using Analytics to Improve Customer Communications

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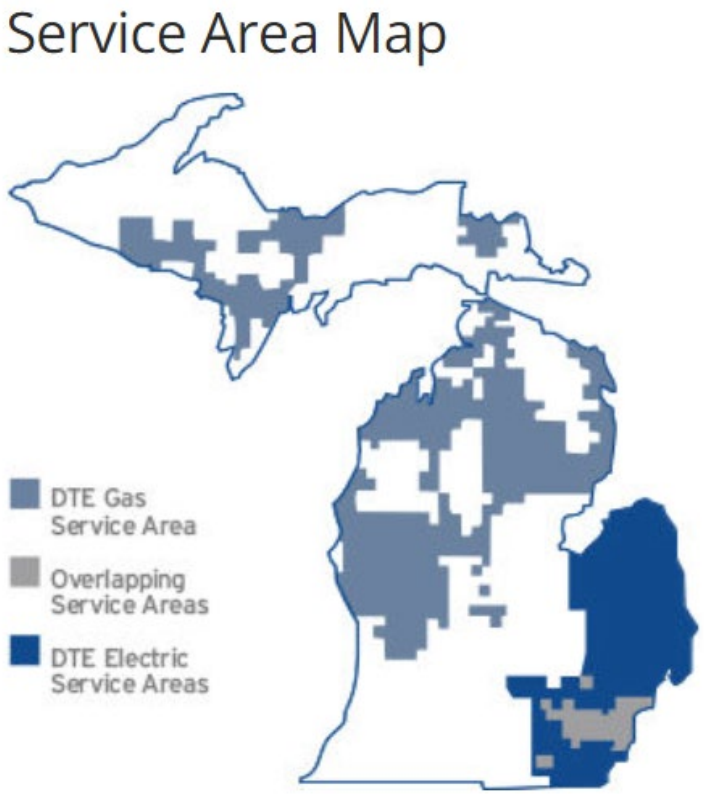
DTE Energy

Agenda

- About DTE Energy
- About Power Outages
- Overview of the EFC Project
- Analytics for Outage Management
- Analytics for Data Quality
- Acknowledging Partners
- Q & A

About DTE Energy

- Headquartered in Detroit, MI
- More than 10,000 employees
- DTE Electric
  - Electric generation and distribution
  - 2.3 million electric utility customers in Southeastern Michigan
  - More than 11,000 megawatt system capacity
- DTE Gas
  - Natural gas transmission, storage and distribution
  - 1.3 million customers throughout Michigan



Customer Interactions During Power Outages

Aside from customer billing and related processes, customer interactions with DTE are usually related to power outages: reporting outages and checking for status updates. Consistent with national figures, power outages for DTE customers are most commonly related to weather incidents.

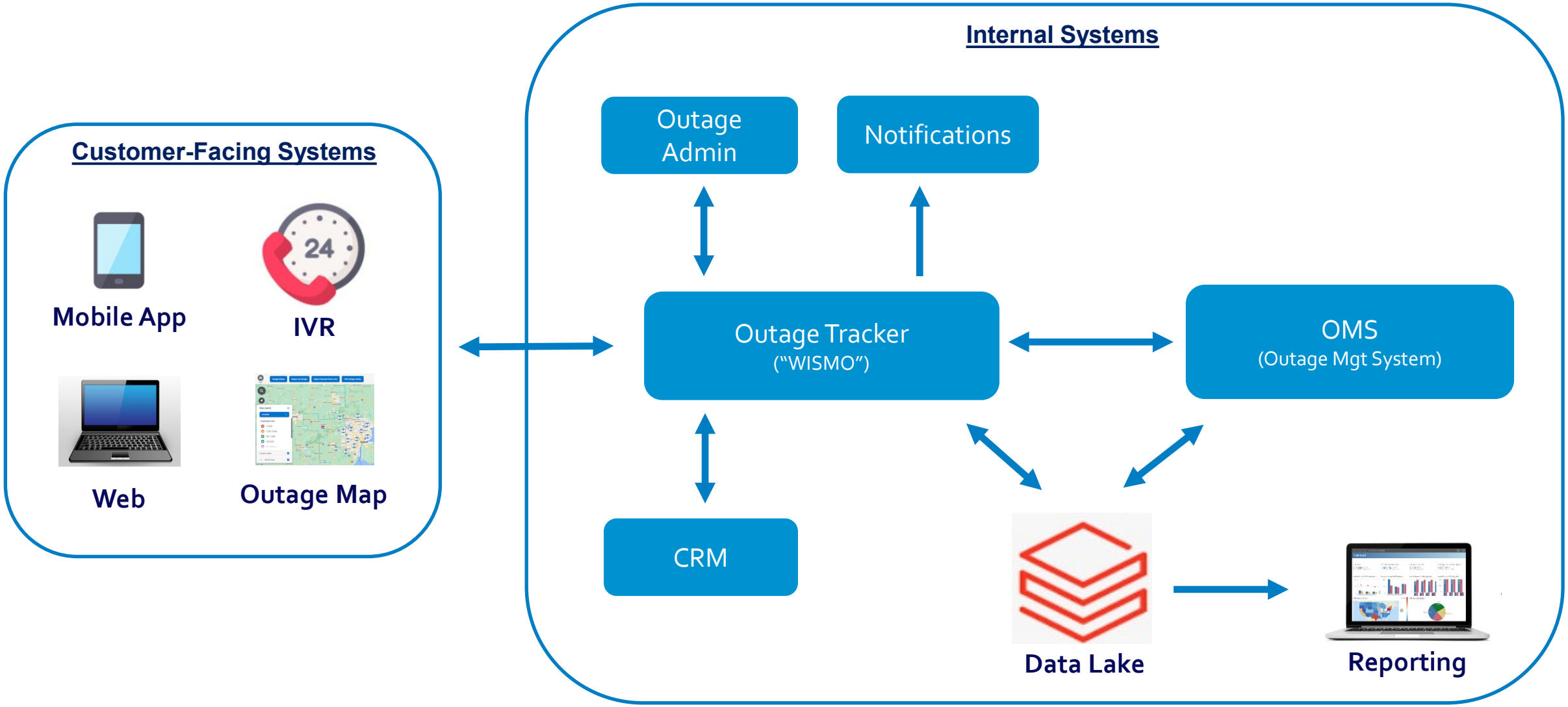
1%	Maintenance
5%	Power Grid Failure
7%	Public or Animal Contact
10%	Unkown
15%	Equipment Failure
62%	Weather or Tree-Related Incidents

Improving Customer Communications – EFC Project

Error-Free Customer Communications (EFC) Project: Starting in late 2021, and currently underway, DTE has embarked on a broad initiative to improve customer-facing processes to report power outages/issues, and check status on resolution.

- Re-design of customer-facing systems to support outage communications
- Re-design & enhancements to several internal DTE applications
- Redeployment of key systems legacy architectures to a more modern, Microsoft cloud platform
- Enhanced internal systems to scale up support for large storms
- Improved monitoring, with enhanced triaging and ability to manage key events

EFC Application Architecture



EFC Testing

We're testing all new functionality, using modern automated testing tools during the development process, enabling rapid regression testing of new enhancements – before they are rolled to production.

Test Case Hierarchy (top 3 tiers):

Types of customer interactions:
- Report outage
- Get status

Types of outages can be reported:
- Power out
- Partial power out
- Dim or bright lights
- Flickering lights

Customer interaction methods:
- IVR (phone)
- Website
- CRM

UiPath™

- **300+** automated Test Cases, representing all user stories to report an outage or get status
- **600+** unique Test Scenarios/Conditions, each utilizing different datasets for different outcomes
- Load testing utilizing API's across all systems to ensure WISMO functions properly during a major outage event → **1 Million** outages at the same time!

Goals for EFC Analytics

Outage Management Status & Triage:

- Improved understanding of the scope and scale of major outage events
- Location of outages and their respective lifecycles
- Elimination of latency in reporting with real-time analysis and alerts

Customer Experience Improvement:

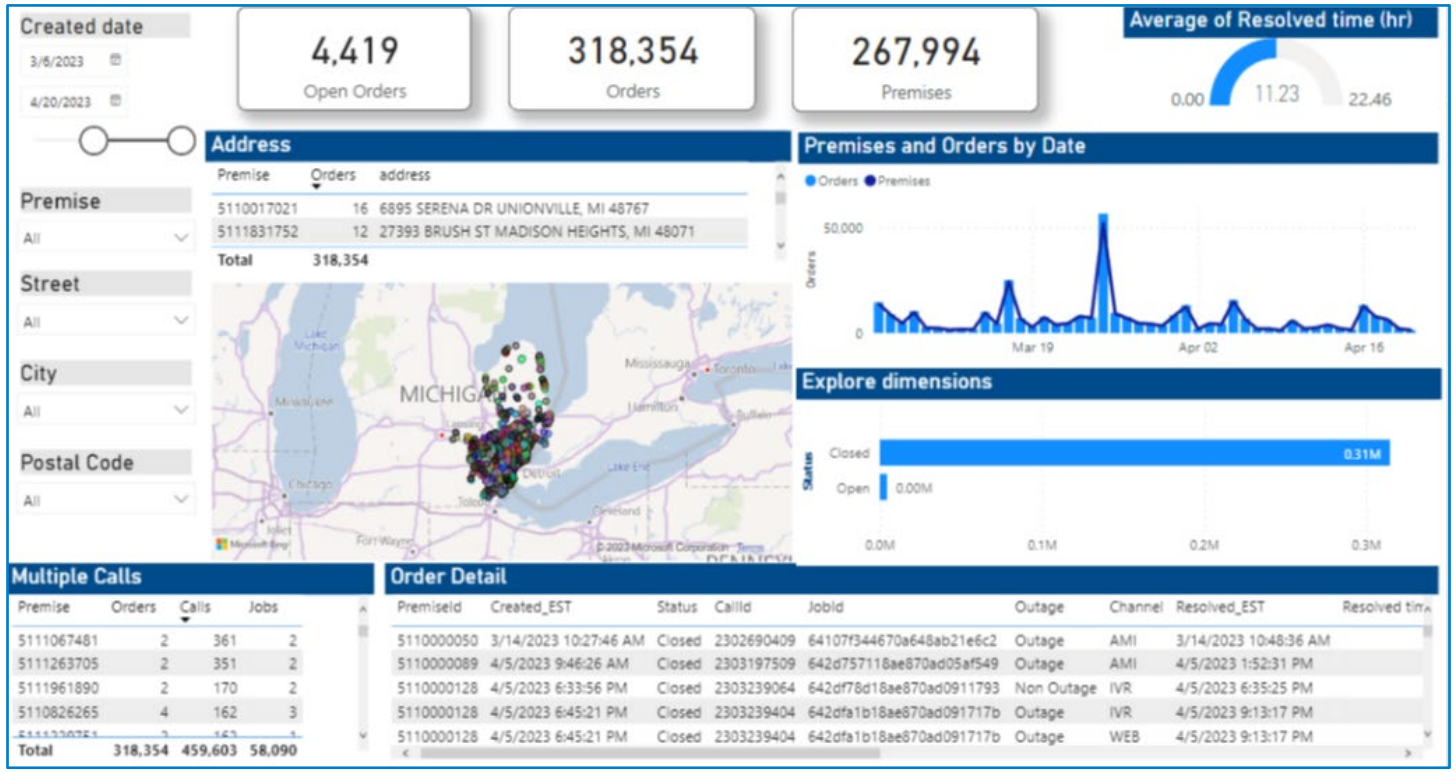
- Analysis of customer service narratives to better understand the customer journey
- Detection of outliers in customer data due to data quality issues
- Improvement of data quality on the outage map

Key Analytics Requirements & Assets

Key Questions:

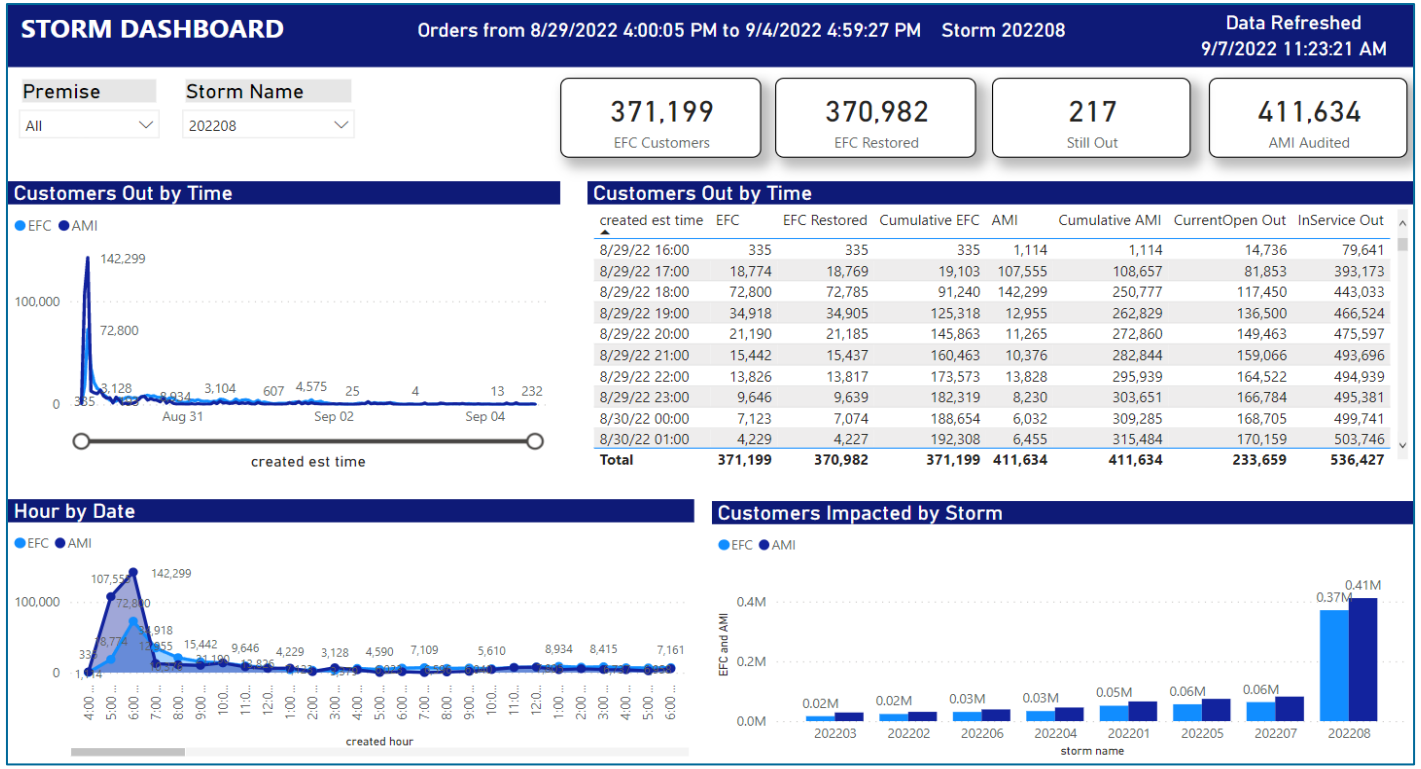
- What are the key metrics?
- How many reported outages?
- What is the current job status?
- What are the lifecycles of customer outages and DTE responses?
- Where are the exceptions and outliers?
- Where is data quality inhibiting communication with customers?

Outage Status Dashboard



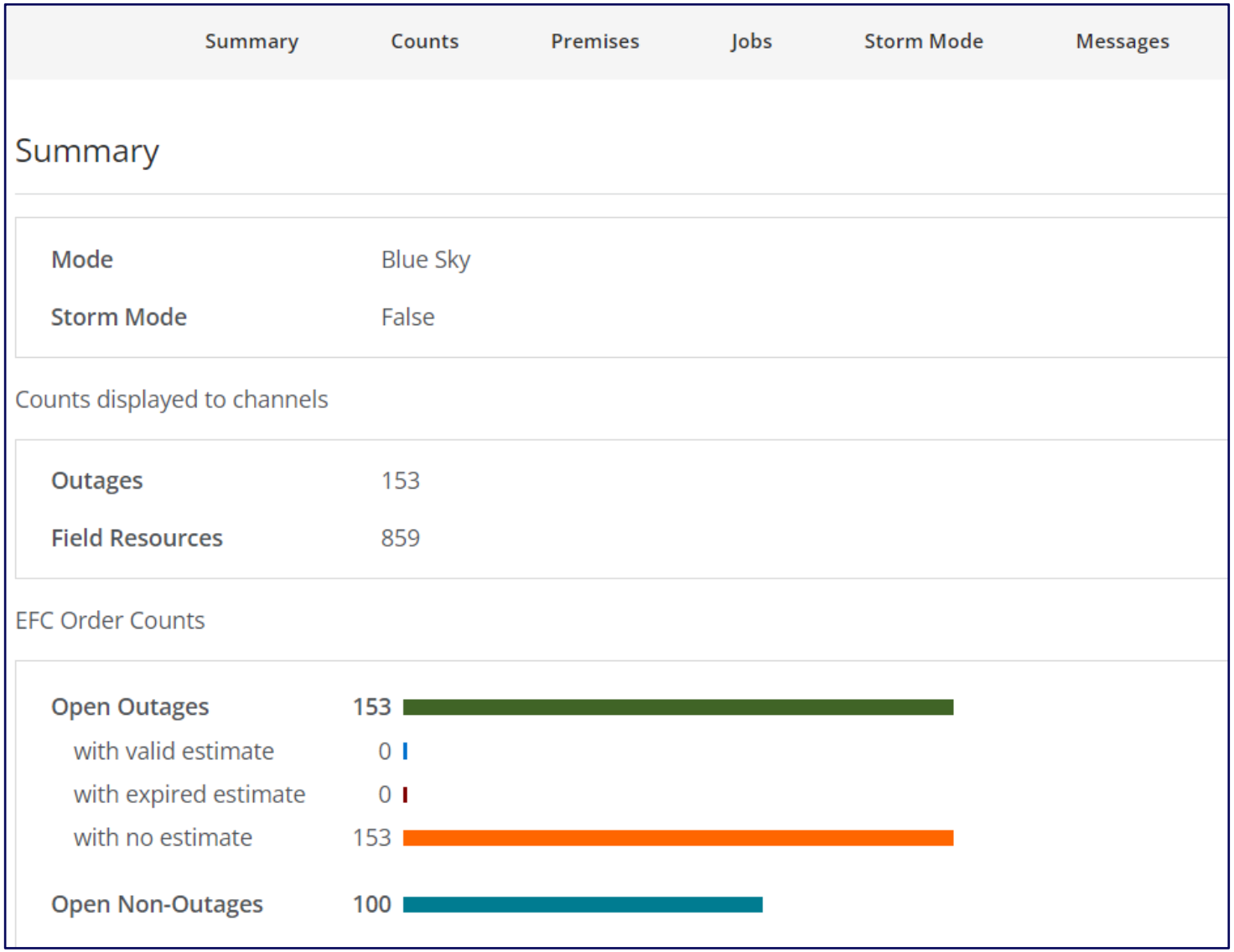
- Real-time open outage status
- Outage lifecycle status (Open > ETR > Restored)
- Outage lifecycle phase duration
- Outage clusters & various related KPIs

Storm Dashboard



- Where are we in the storm?
- How many customers are impacted?
- What is the restoration progress?
- Outage time series
- Comparison to previous storm events

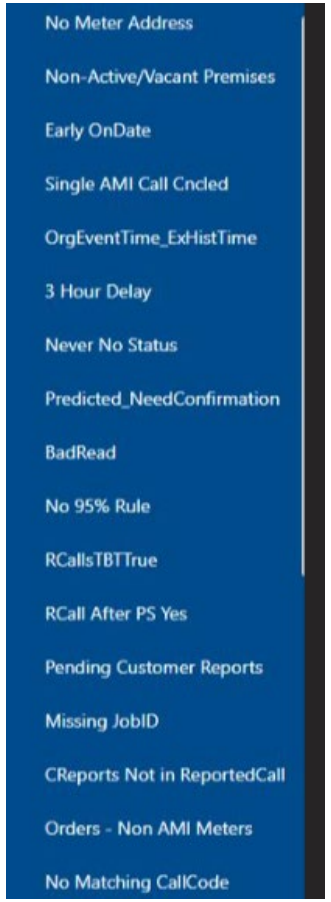
Outage Admin Dashboard



- Active outage summary with the ability to drilldown to an individual customer
- Manages storm messaging and events
- Identifies the correlation between the current customer status, and the “job” activity to restore a customer outage

Data Quality Identification & Remediation

Master list of data quality reports

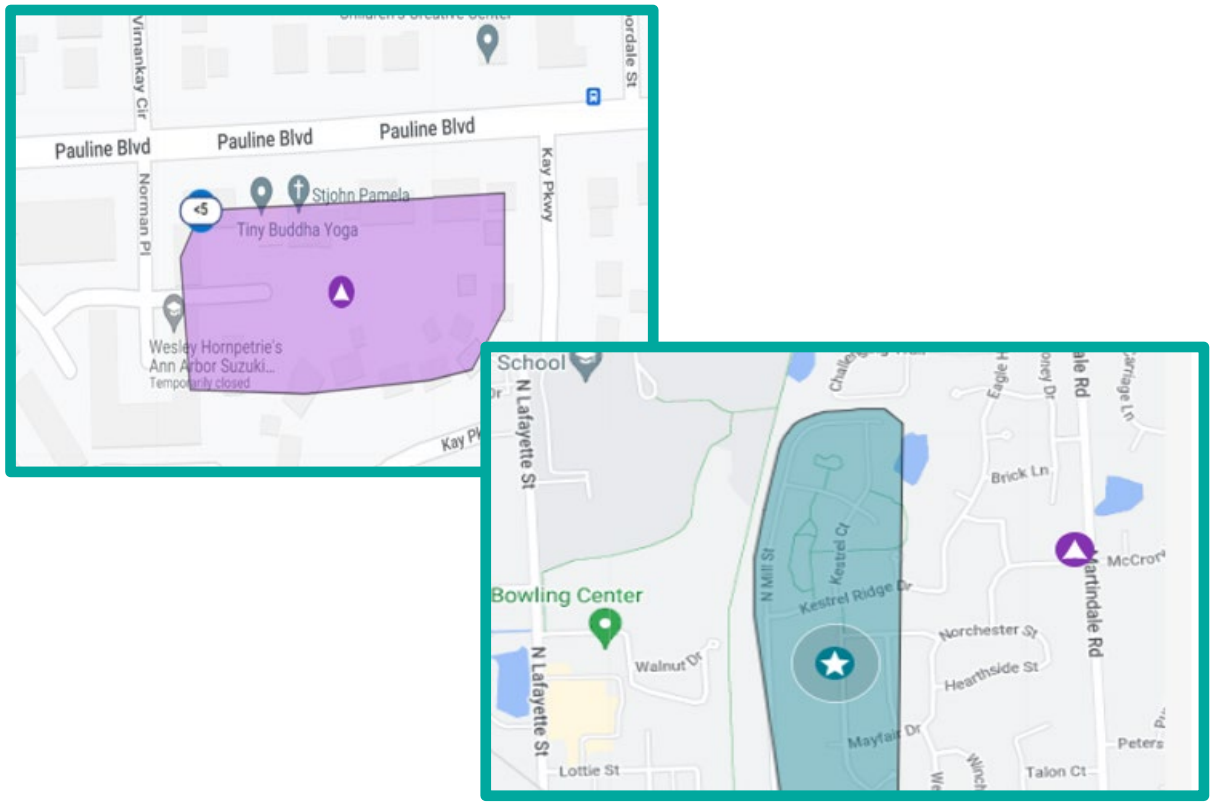


Category	Data Quality Scenarios		
Source Data Issues	Incorrect Source Data	Multiple Customer Addresses	Incorrect Lat/Long Data
Data Issues Generated By Faulty Business Logic	Outage Status Updates	Event Data Mismatches	"Trouble Behind Trouble"
System/ Equipment	Faulty AMI Metering Indicators	System Outages	Scalability

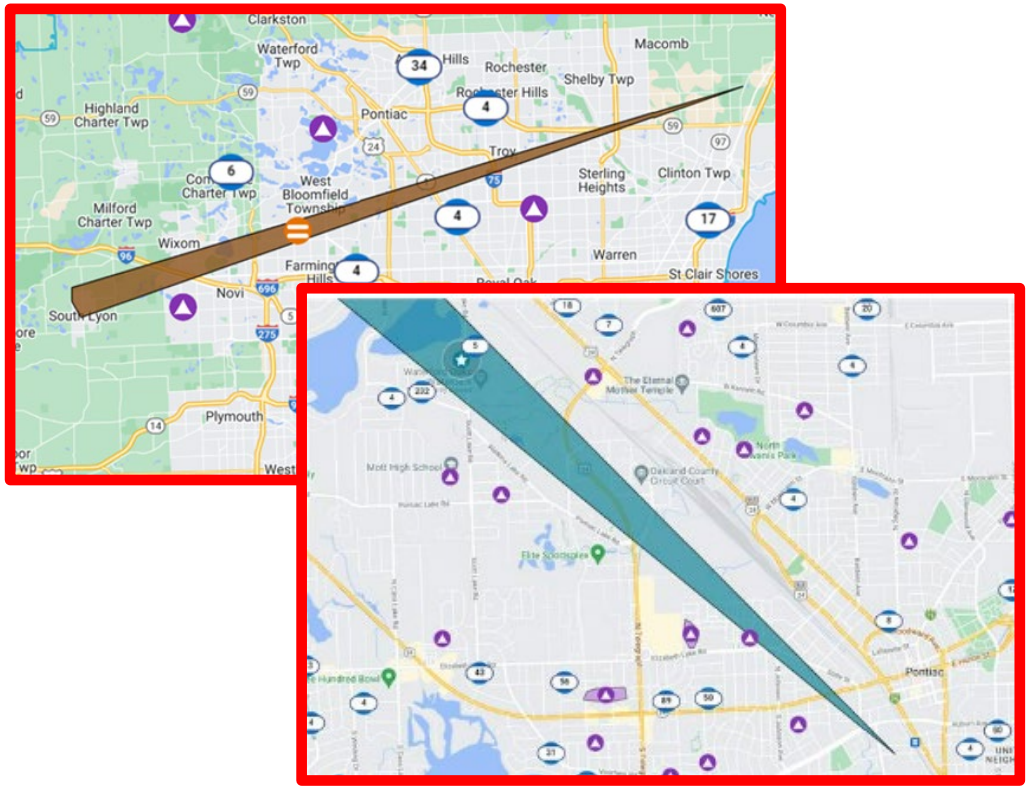
Outage Map Data Quality Problems

Pre-production testing identified thousands of “needles, daggers, darts, arrows thru my heart, etc.” on the map, signifying mismatched Lat/Long data for specific customer locations and meter/transformer data…

Polygons = Good

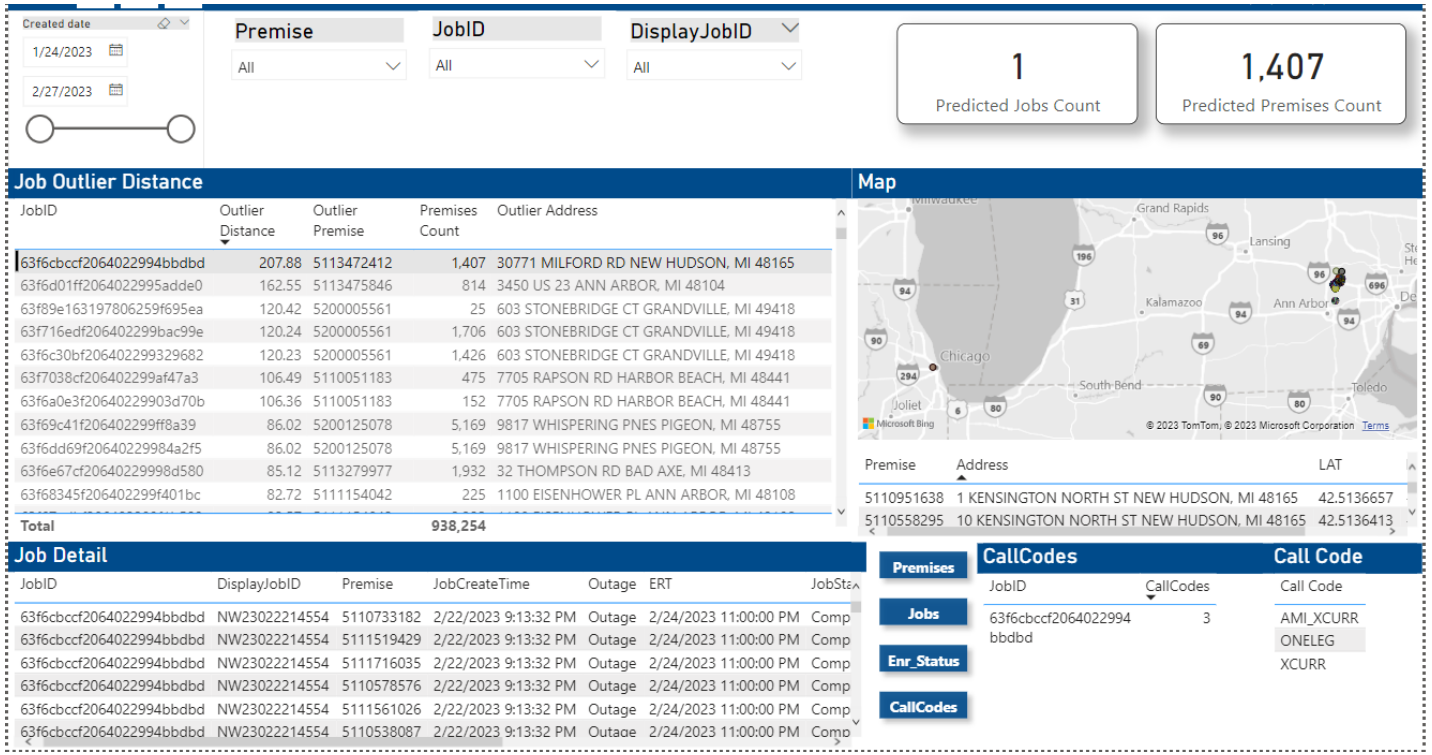


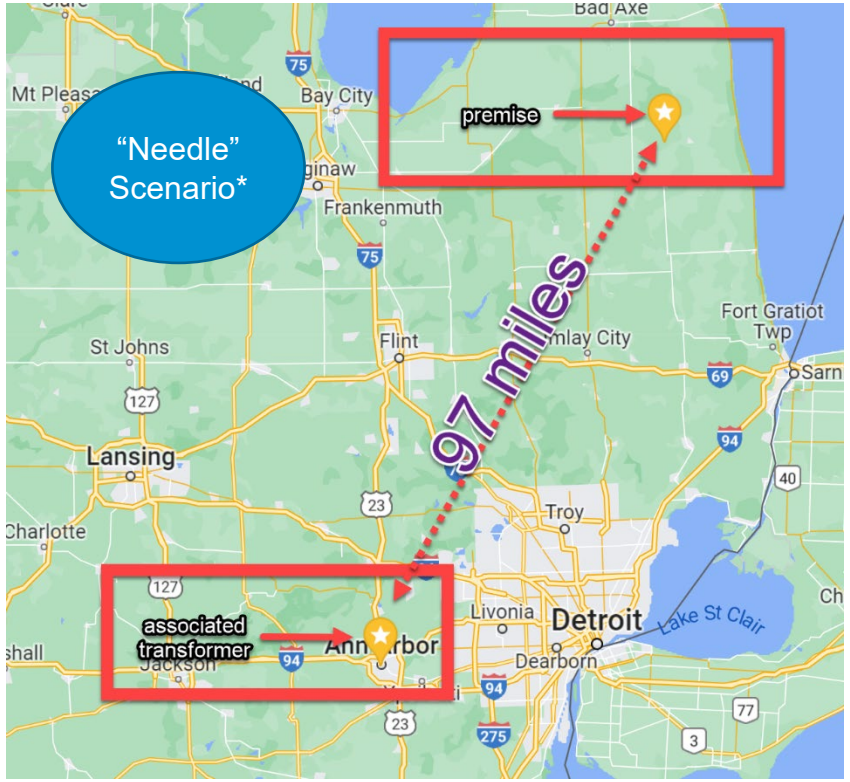
Needles = Bad



Outage Map Data Quality Resolution

- Intuitive data mining techniques identified data quality issues on the outage map. For example, calculating the distance between the customer address (“premise”) and its associated transformer.
- Using Alteryx, several address consistency workflows were developed to identify problems
- Developed several dashboards to document the findings:





**Ultimately resolved through Google Maps address cleansing API integration*

Services & Software Partners

- Local analytics & automation consulting group, since 1996
- Long-time partner at DTE
- End-to-end expertise in dashboards, data quality management, and automated testing

- Global leader in analytics automation & data blending
- Primarily used to identify and remediate data quality and business logic issues

- Cloud DevOps architecture and API backbone
- Power BI data visualization

- Global leader robotic process automation & software testing tools
- Automated test case management & regression test suite

Thank You!

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