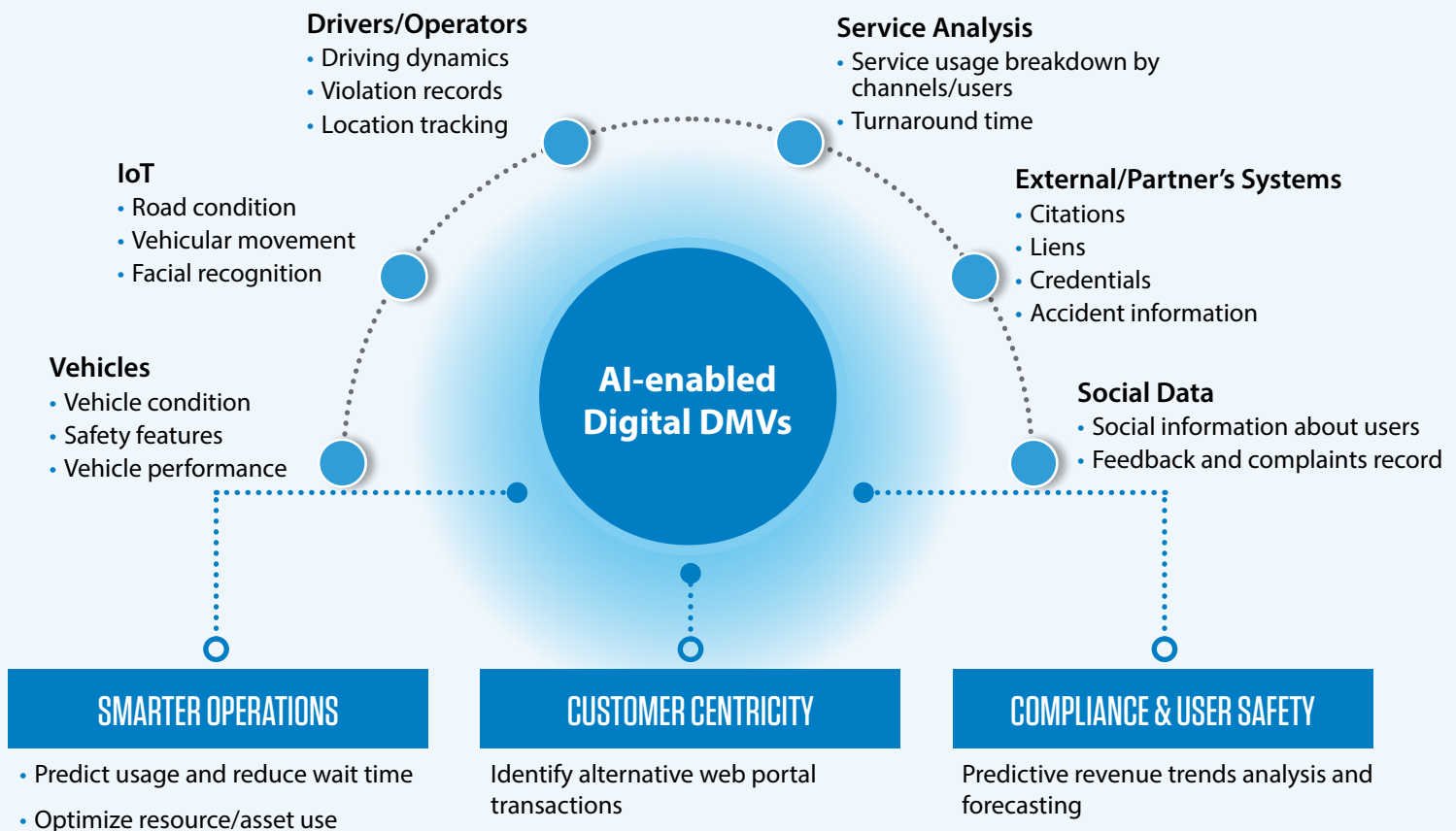# AI-ENABLED DIGITAL DMV SERVICES

Abstract

DMVs are evolving to become more virtual and connected. They have access to a variety of data sets from basic licensing, vehicle registration, violation and accident records to information about service usage across channels (mobile devices, web based and in-person), and new sources like data from IoT/connected devices and customers' online behavior.

An automated data-science platform can help DMVs manage this multi-format and multi-type data end-to-end and deliver AI-driven next best actions to all the stakeholders. The platform's advanced data science capabilities enable DMVs to focus on how data can inform and support their ability to predict and prepare for unforeseen situations, customer service improvement, and generate operational insights.

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An automated data-science platform

With this platform, DMV agencies can take their digital transformation to the next level and deliver more proactive, personalized data-driven services like the ones below.

- E-notifications and alerts that recommend relevant services to customers proactively

- Determine demand patterns for more efficient future online and in-person services

- Identify and implement alternative customer centric service models such as web services, kiosks, and mobile devices

- More efficient appointment setting

- Classify and identify fraudulent transactions and suspicious activity, providing alerts for real time intervention

- Forecast resource usage and allocation, and predict revenue trends as DMVs realign services to meet real time customer demands

Drivers/Operators
- Driving dynamics
- Violation records
- Location tracking

Service Analysis
- Service usage breakdown by channels/users
- Turnaround time

IoT
- Road condition
- Vehicular movement
- Facial recognition

External/Partner's Systems
- Citations
- Liens
- Credentials
- Accident information

Vehicles
- Vehicle condition
- Safety features
- Vehicle performance

AI-enabled Digital DMVs

Social Data
- Social information about users
- Feedback and complaints record

SMARTER OPERATIONS
- Predict usage and reduce wait time
- Optimize resource/asset use

CUSTOMER CENTRICITY
Identify alternative web portal transactions

COMPLIANCE & USER SAFETY
Predictive revenue trends analysis and forecasting

How an automated data-science platform works

As the name suggests, an automated data-science platform leverages automation and AI to manage the management and analytics cycle end to end. The platform aggregates, masters, ha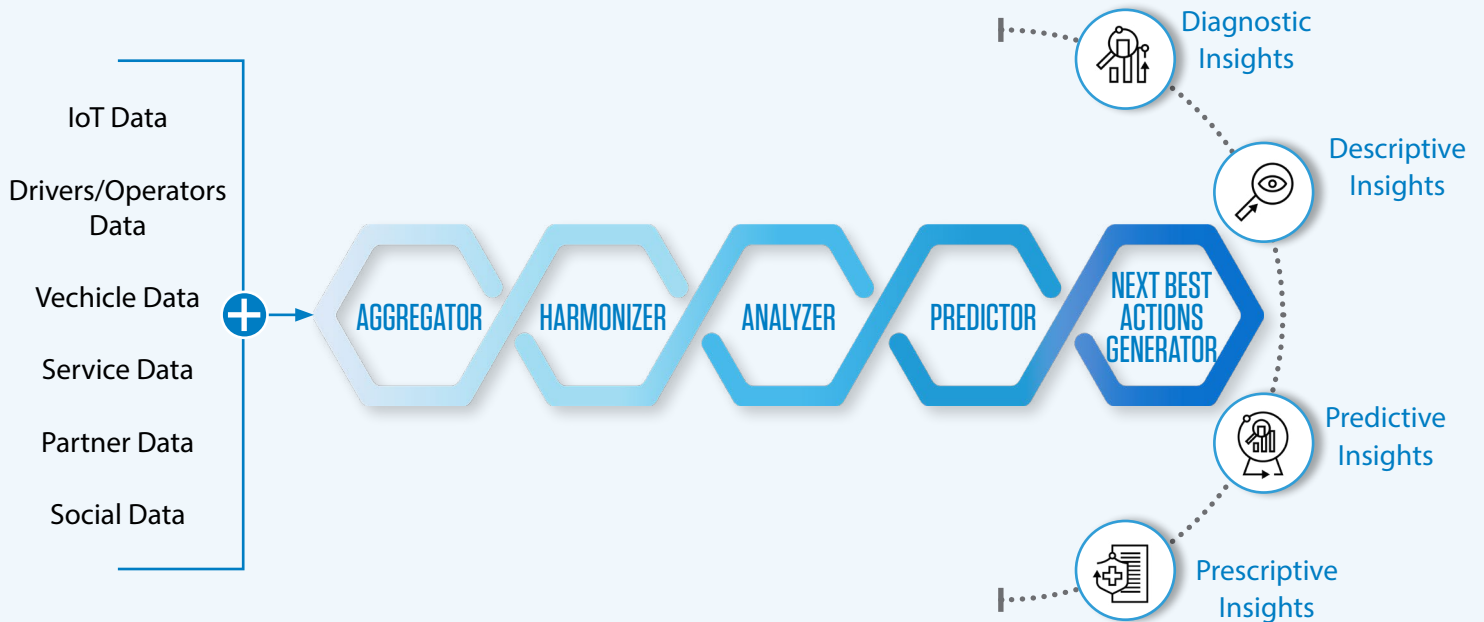rmonizes and profiles various types of data to create a 3-dimensional view of each related entity (driver, commercial carrier or vehicle to title), and further leverages automated machine learning-models to generate insights and actionable recommendations. These can be disseminated as next best action recommendations with all relevant stakeholder through inbuilt APIs.

The key components as shown on the next page can orchestrate these workflows.

KEY COMPONENTS TO ORCHESTRATE ANALYTICS WORKFLOWS

DATA AGGREGATOR — Built-in Parser factory to readily ingest polymorphic data (less ETL) and support polyglot persistence (data storage) through automated data mastering, harmonization and consolidation

DATA HARMONIZER — Validates, normalizes and cleanses the data to establish 360-degree models of the client data

DATA ANALYZER — Data profiling for an in-depth understanding of root causes or to uncover hidden information

DATA PREDICTOR — Machine learning-based modeling to predict future states

NEXT BEST ACTION GENERATOR — AI to analyze information from previous stages and generate actionable recommendations

IoT Data

Drivers/Operators Data

Vechicle Data

Service Data

Partner Data

Social Data

+ → AGGREGATOR → HARMONIZER → ANALYZER → PREDICTOR → NEXT BEST ACTIONS GENERATOR

Diagnostic Insights

Descriptive Insights

Predictive Insights

Prescriptive Insights

Examples of how automated data-science platform can help DMVs

Use-case 1: Improving operations

DMVs can collect the data to track trends for both before the pandemic and during the pandemic timelines. Using this data and the automated data-science platform, they can produce Forecasting Time-Series Models. These models can determine in-office customer patterns, peak transaction times - daily, weekly, monthly and seasonally. This information

can provide predictive post-COVID-19 office management recommendations for improving staff distribution, scheduling, budget forecasting and auditing.

The platform can also forecast revenue trends, which are invaluable to exposing gaps within traditional in office transactions and assist in revenue

projections (budgeting) and help identify new service areas. And, DMVs will be able to track trends and transaction volumes on the web portal for the same timelines to help examine transaction usage patterns and forecast future trends.

Use-case 2: Optimizing resource utilization

The platform can also help DMVs optimize resource utilization. For example, the post COVID era will provide a revenue challenge as in-office transactions will be less frequent and web transactions are not fully realized and mature.

As DMVs move to provide more services over the web, understanding the historic transaction volumes and types can assist them in determining candidates for post pandemic web portal planning.

It is not just a volume issue, it's about identifying value and opportunities to streamline services, expanding online virtual offerings and delivery channels, and reducing overall office traffic as a tool to support social distancing.

Additionally, the platform is an effective customer research tool to advance and promote self-service online transitions by leveraging social listening. Social media research analyzes social media data to conduct quantitative (and at

times qualitative) studies to understand how customers react to current services and what services they would like to see offered in the future.

The platform harmonizes traditional data and social media insights, develops predictive models, and provides the best actionable recommendations for the implementation of new and more effective web services while stabilizing revenue and extending new channels of post COVID services.

IDENTIFY	LEVERAGE	PREDICT
Identifying candidates for web portal transactions	**Leverage social media listening + DMV traditional data**	**Produce predictive insights**

• Simple transactions that can be performed without DMV intervention
  » Includes high volume transactions
• Automation to identify eligibility of a customer
• Customer accounts for authentication
• E-payment candidates
	• Social media sources
	  » Twitter, TikTok, Instagram, blogs, DMV customer service
	• DMV traditional data sources
	  » Driver/operator, registration, revenue accounting
		• Identify improvement opportunities
		• Implement customer-based services to the web
		• Uncover critical processing gaps that can improve services

The DMV staff won't need to be data scientists or require advanced analytics skills to use this platform.

In conclusion

COVID-19 has created an opportunity for a critical review of how DMVs provided services pre-COVID-19 and how that has been totally upended by the pandemic.

Digital DMV Services can leverage an automated data-science platform that uses data science analytics/machine learning to create data models forecasting transactional trends, providing insights for revenue generation, determine new areas of potential automation and efficiency improvements, and advanced

data aggregation capabilities to identify candidates for web portal services.

The forecasting tool provides clear visibility into how data is processed, with outcomes that provide confidence and traceability to guide service recommendations and ultimately improve customer service offerings:

• To provide alternative methods of service and revenue generation

• Predictive analytics to enhance business continuity planning

"Never let a good crisis go to waste"[1]
A classic Rham Emmanuel line that has been more that proven true by COVID19. The pandemic has exposed opportunities for change and accelerated implementation of new initiatives that would most likely not have been considered or would have been delayed pre-pandemic. The use of predictive analytics and data modeling makes the case for change through an automated data-science platform.

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