



Now
Knows
Green



Presenting
By
Daphne Liu



CO₂ GREEN COPONENTS

MATRIX
Think Green... Reuse... Recycle
Green Journey



CO₂ GREEN FORMULA



$$\text{CO}_2 = \text{Weight} * \text{Distance} * \text{CO}_2 \text{ Factor}$$

Package
Pallet
Container

City Pair
Port Pair
Stops

Truck Size
Air Plane Type
Medium Distance
Long Distance



- Reduce Package Weight as much as possible
- Use Optimized Trip Distance Routes (Planned in advanced)
- Consolidate to Pallet/container and use large truck size carriers
- Use Cargo Plane rather than Belly Freight
- Ship with Rail and Ocean if timeframe permits



OUR APPROACH

CO2e Reduction

- Minimize CO2e by Optimized FTL Load
- Replaced Air Route with Rail Ocean ones at Order/Scheduling Time

Air & Ground

- Air & Ground trip consolidation
- opportunity alert
- CO2 Green Carriers

Air

- Air route with minimum stops
- Top CO2 friendly airlines



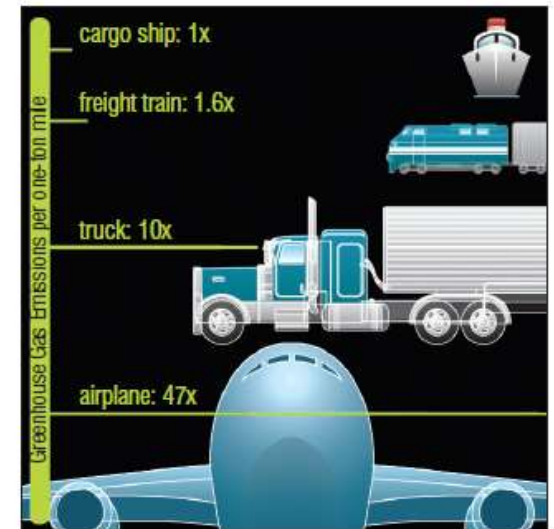
CO2e Reduction ML Model

Using CO2e emission Factors & Consolidation Algorithms



Ground

- Co2e emission factor (per Tonne Km), on truck 3.5t > 7.5t > 20t > 40t
- Based on cargo weight and select the minimum truck size CO2e factor
- Trip consolidation algorithms based on [Origin] triggered at order level and advise consolidation opportunities
- Shipping Unit Optimization from Package to Bulk/Pallet or Container
- Rail route alert if city pair rail transits are available



Christine Daniloff/MIT News



Use Green Conscious Airlines

Air

- Co2e emission factor (per Tonne Km), on aircraft Belly freight > Cargo plane
- Prioritized air carriers from Cargo plane -> Belly freight
- Prioritized air carriers by number of airport stops of each city pair
- Top Co2e Airline Index
- Shipping Unit Optimization from Package to Bulk/Pallet or Container
- Ocean route alert if delivery date are 6 week ahead





Co2e Emission Intelligence

- Co2e Emission Indexes on Air, Ground, North America & Europe
- Co2e Linear Regression Forecast Model on trend and season
- Trip consolidation opportunity cluster model by OD path & Delivery Date
- Co2e Emission Saving Calculator
- See Dashboard Presentation

Nike Green Freight CO2 Consolidation (Ground)



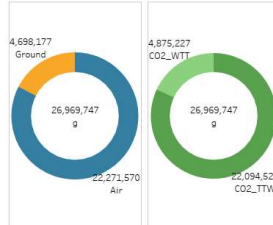
CO2 Consolidation (Air)



North America

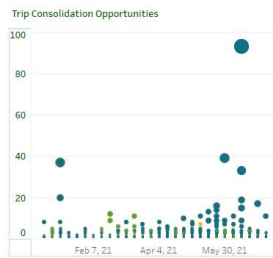


Europe

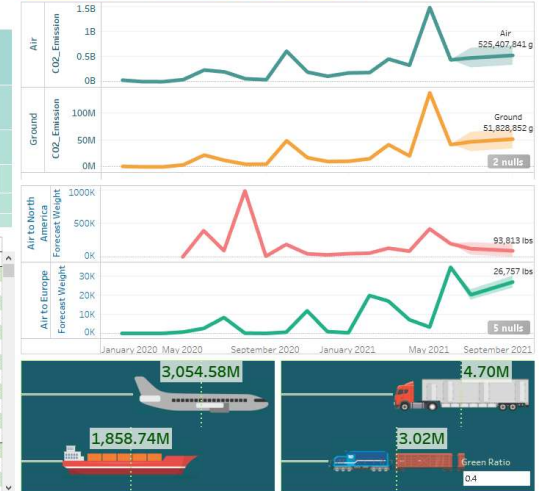


CO2 Consolidation Opportunities By Origin (Ground)

Origin	CO2 Emissions (g)	Trips
JO-LMJ	1,037,385	111
CN-EAG	69,835	64
CN-WIG	233,868	42
CN-LN	155,660	33
CN-SZ	155,660	33
CN-SAC	335,570	51
CN-VKT	289,530	40
CN-VN	177,638	36
TH-NAY	178,297	51
CN-CSC	376,722	72



U.	F.	ULT.	F.	Week o.	Week of	SAME_WEEK_DAY_COU.	SAME_DAY_TRIP_COUNT	CO2_Emission
Grand Total						2,152	5,978	2,549,268.11K
VN-VY	1014					5	25	369,512.69K
VN-VY	1014					1	2	48,129.51K
VN-VY	1014					1	2	50,771.94K
VN-VY	1014					1	2	50,667.73K
VN-VY	1014					1	2	219,943.51K
VN-VY	1014					1	3	71,516.90K
VN-VY	1014					1	4	71,516.90K
VN-VY	1014					2	3	39,442.97K
VN-VY	1014					2	3	39,442.97K
VN-VY	1014					1	2	2,404.24K
VN-VY	1014					1	2	2,404.24K
VN-VY	1014					9	40	440,290.96K
VN-VY	1014					1	4	53,701.86K
VN-VY	1014					2	8	106,950.45K





We can be more GREEN



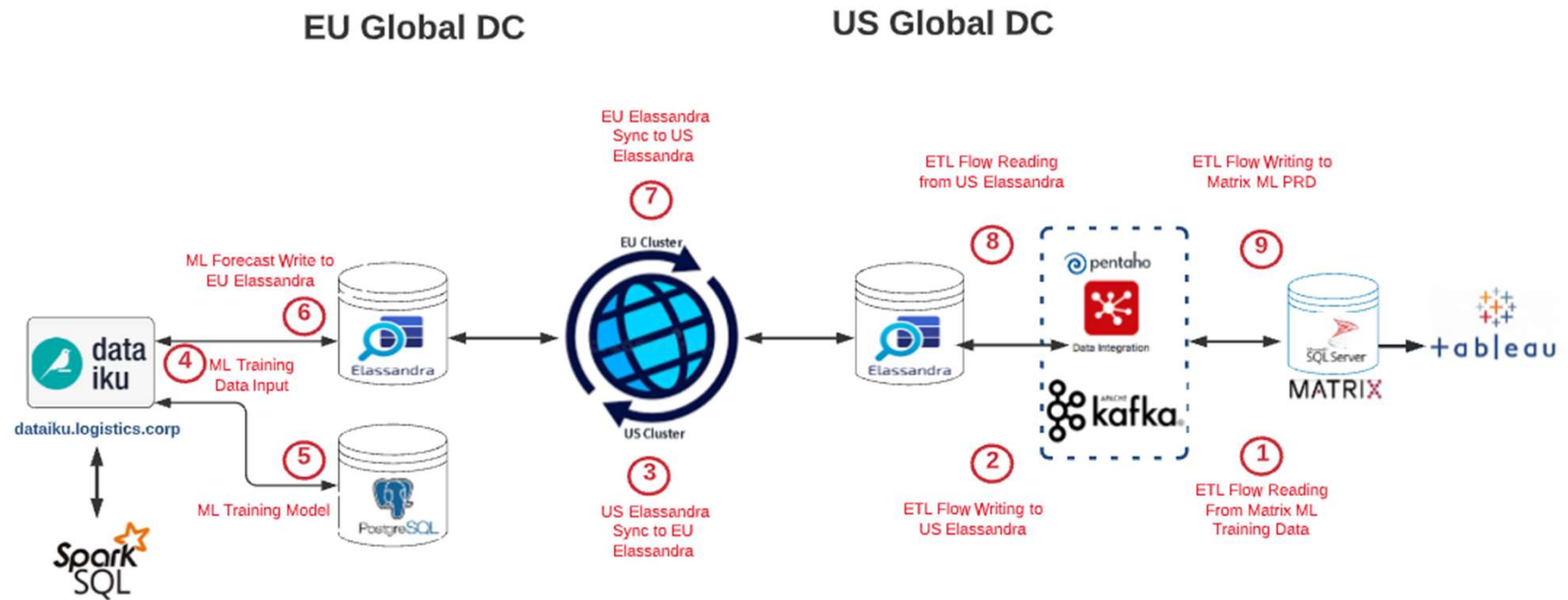
- City Pair based shipment **CO2e** discovery panel
- CO2e forecast based on air/ocean port and routes
- Interactive CO2 calculations driven by distance, weight & **CO2e** visualization
- **Consolidation opportunity advisor** by day, week on air/ocean ports
- **Route wizard** suggests **CO2e** reduction route and trip combination
- **Green calculator** delivers optimized **CO2e** shipment and execution plan



Our Challenges

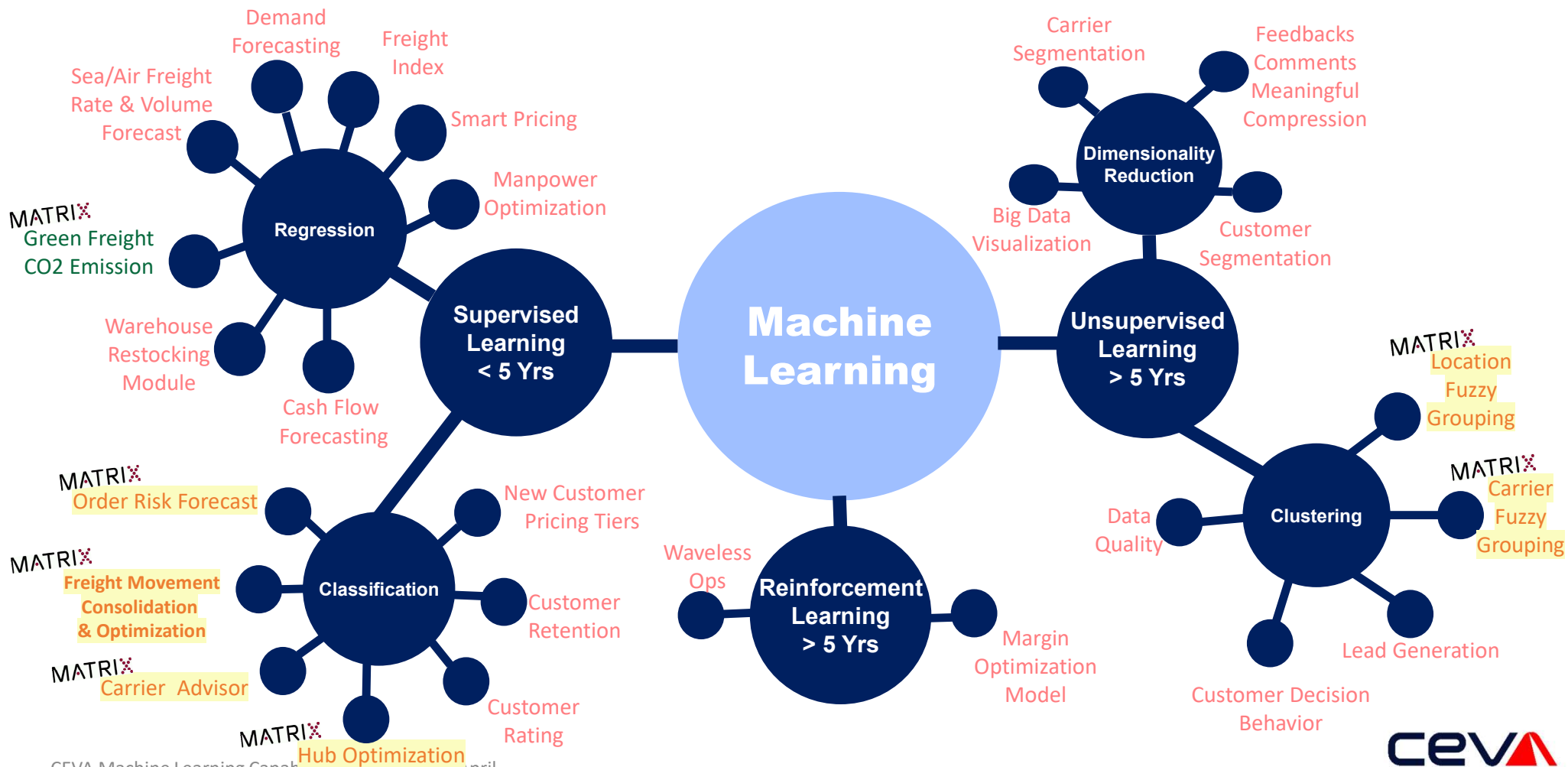
- Data Quality
- Data Mapping
- Changes in Operations

Enterprise Green Architecture

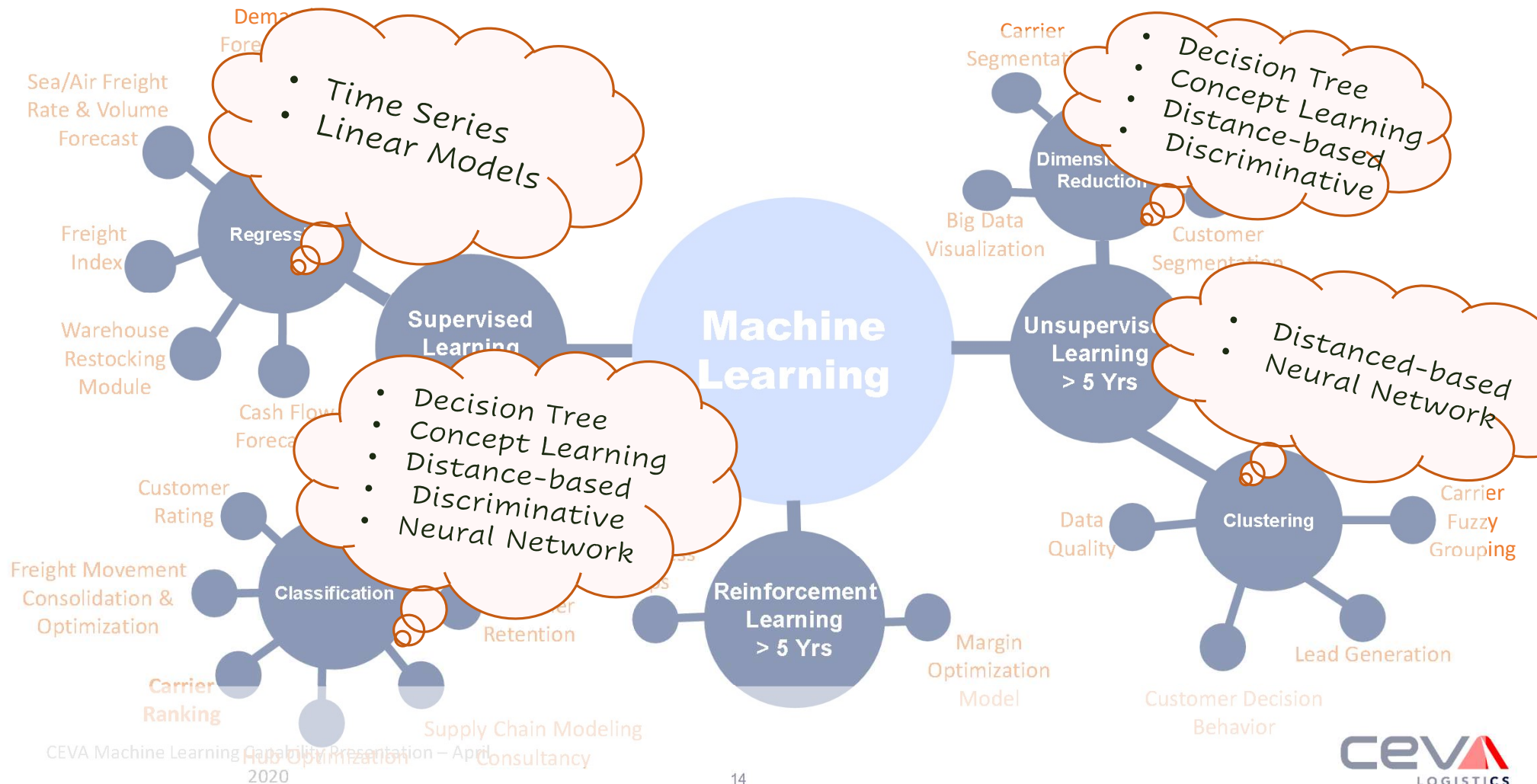


THANK YOU

TAXONOMY OF MACHINE LEARNING METHODOLOGIES IN LOGISTICS



TAXONOMY OF MACHINE LEARNING ALGORITHMS IN LOGISTICS

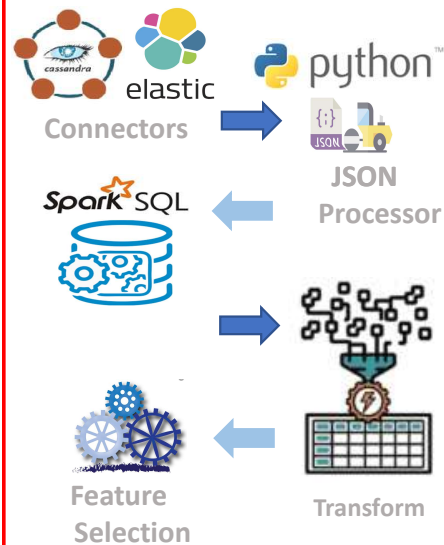


Matrix Big Data Machine Learning Data Architecture

★ Data Lakehouse



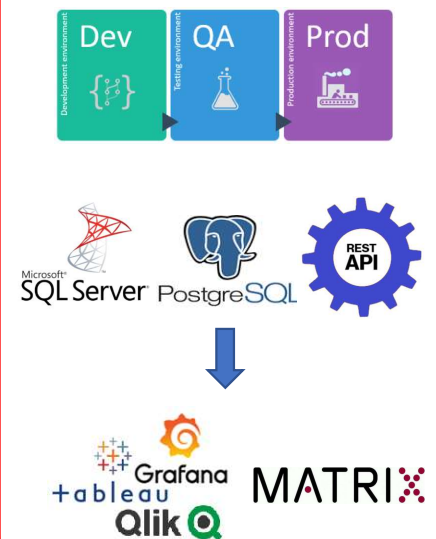
★ Data Engineering



★ AutoML Training



★ Model Deployment

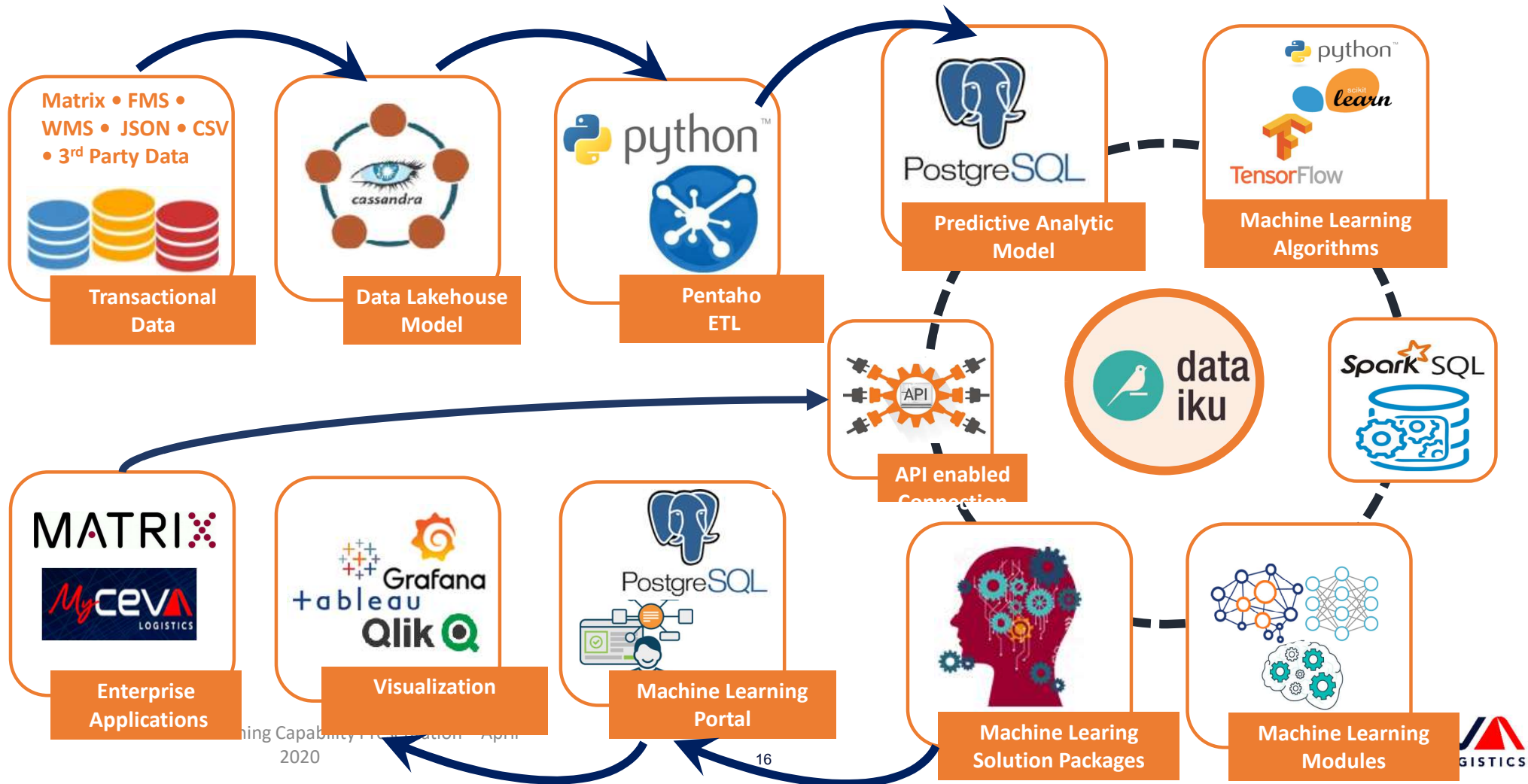


Big Data Parallel Processing
Multi-Threaded Bulk Data Loading

Big Data Training Process

Trained Machine Learning Models

MACHINE LEARNING/AI PORTAL ARCHITECTURE



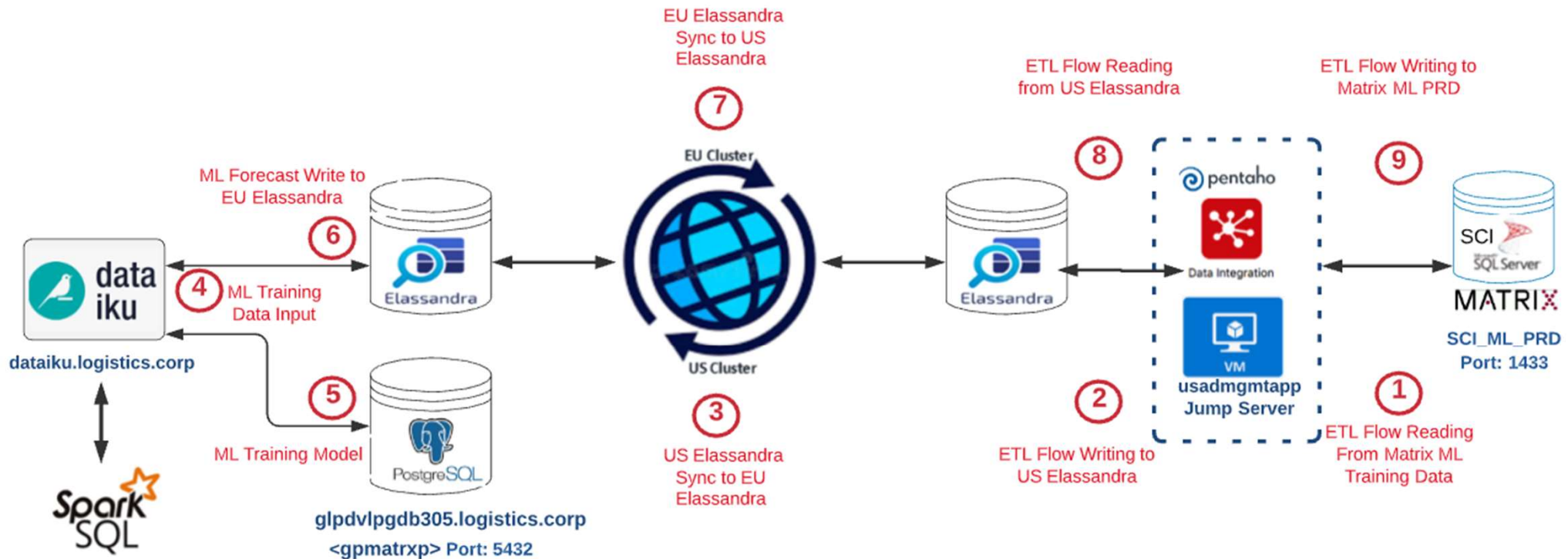
MATRIX ML Data Architecture

EU Global DC

eudceast-nonprod-cassandra.keu.logistics.corp
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US Global DC

usdceast-nonprod-elasticassandra.kus.logistics.corp
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MATRIX Digital Platform Modules

Supply Chain Intelligence as a service (SClaas)

Machine Intelligence as a service (Mlaas)

Supply Chain Smart API?

- **Service at Order & Scheduling level**
 - Order Risk Analysis by City Pair, Carrier, Service Level and Seasonal Trend
 - CO2e Aware Advisor
 - Freight Movement Consolidation
 - Carrier Advisor
 - Milestone Intelligence
 - Freight Movement Consolidation
- **Service at Network Planning**
 - Load Forecast on Route & Lane
 - Hub Optimization
 - Freight Cost Index & Trend (FSS)

