From AI-Augmented to Self-Driving Data Management & Governance

A conversation with

Michal Klaus
CEO
Ataccama

Mike Meriton
Co-Founder & COO
EDM Council
Moderated by **Mike Meriton**  
Co-Founder & COO, EDM Council

- Joined EDM Council full-time 2015 to lead Industry Engagement
- EDM Council Co-Founder & First Chairman (2005-2007)
- Former CEO GoldenSource (2002-2015)
- Former Executive for D&B Software and Oracle
- FinTech Innovation Lab – Executive Mentor (2011 – Present)
Presented by Michal Klaus, CEO, Ataccama
Businesses in the times of Corona (virus)

Impact on business

1. Revenue uncertain, hard to predict
2. Limited resources (money, people)
3. Customers fleeing to the digital world
4. Employees working remotely

Likely response

1. Fixed costs → 0 and flexible
2. Do more with less, automate
3. Apps making remote work efficient, pleasant, doable
4. Customer facing processes primarily digital
Data in the times of Corona (virus)

**Likely response**

1. Fixed costs → 0 and flexible
2. Do more with less, automate
3. Apps making remote work efficient, pleasant, doable
4. Customer facing processes primarily digital

**Where’s the data in it?**

1. Have data instantly available for various business needs. Cloud.
2. Data available ideally without the need for people to prepare it.
3. People and algorithms need to easily collaborate on data.
4. Without high quality, consolidated data, there’s no digital.
“Simple” requirements for data

› **Migrate** data from decommissioned ERP to a new one with data quality checks and deduplication **WEEKS**

› **Data Mart** for marketing analytics and campaigns **DAYS**

› **Create a data source of all customer and product data** for a new self-care mortgage app **WEEKS**

› **Find data** sources and their quality for a new data science project **MINUTES**

› **Set up data quality monitoring** for a newly added data source to a data lake **HOURS**

› Establish centralized **reference data management** **WEEKS**

› **Provide regulatory** enforced data quality and data lineage reports **WEEKS**

› Transactional **MDM hub** for customer and product for new self-care portal **MONTHS**
It’s time to revolutionize data management and governance

Automation
True self service
Time to “market” 10x faster
Usability and robustness (no toys)
Flexibility
Fully manual
Automatic (still pretty much manual)
AI-Augmented Data Management

Summary
Data Management and Data Governance

- Data Discovery & Profiling
- Metadata Management
- Data Quality Management
- Master & Reference Data Management
- Data Preparation
  - Big Data Processing
  - & Data Integration
Anomaly detection

**INTRA-LOAD ANOMALIES**
- Anomalies detected in one object
- Profiling (value) outliers, pattern outliers etc.

**INTER-LOAD ANOMALIES**
- Comparing how certain object develops in time: **Data dynamicity & trends**
- Anomalies in data profile series, in DQ results etc.
Anomaly detection

Summary

Attributes: 7

Data sources: Europe, Flights, Flight party

Data quality overtime

Description

The record of the transaction is stored in a place where the retention can be guaranteed and where data is archived/removed following a retention period. The format of the transaction can be data (to be stored in a database), but it can also be a document.

Real-time systems attempt to guarantee an appropriate response to a stimulus or request quickly enough to affect the conditions that caused the stimulus. Each transaction in real-time processing is unique; it is not part of a group of transactions.

Glossary terms

- GDPR
- First name
- Last name
- Gender
- Country
- Price
Anomaly detection
# DQ Monitoring | Apply rules on your data

## Transactional Customer Data / retail_customer_party / Configuration

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Terms</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td># primary_key</td>
<td></td>
<td>ID uniqueness</td>
</tr>
<tr>
<td>name</td>
<td>Full name, Pattern</td>
<td>String completeness</td>
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<td>gender</td>
<td>Gender, Enum</td>
<td>Gender validity</td>
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<tr>
<td>customer_type</td>
<td>Enum, Pattern</td>
<td></td>
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<td>birth_date</td>
<td>Day, Pattern</td>
<td>Birth date validity</td>
</tr>
<tr>
<td>personal_id</td>
<td>SIN, NINO, SSN</td>
<td>SSN validity 1/2</td>
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<tr>
<td>card_number</td>
<td>...</td>
<td>Card number validity</td>
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<tr>
<td>email</td>
<td>E-mail, Enum</td>
<td>Email validity</td>
</tr>
<tr>
<td>phone_number</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>country_code</td>
<td>...</td>
<td>SSN validity 2/2</td>
</tr>
</tbody>
</table>

## Apply validation rules

### Browse rules

- Birth date validity: Day
- customer_type
- Card number validity
- Date format validity
- Email validity
- In_data
- phone_number
- Email
- country_code

### Used rules

- [ ] birth_date
- [ ] customer_type
- [ ] card_number
- [ ] date_format
- [ ] email
- [ ] phone_number
- [ ] country_code
AI Data Matching

Traditional approach: Rule-driven data matching proposals

AI Matching: Automated matching proposals
Utilizing Active Learning

Synergy of AI Matching & Traditional rule approach

Rule suggestions
& rule set updates
AI matching proposals - training

- Model training utilizes user’s inputs to generate the proposals
## Explainable AI Rules Suggestion

### Suggested Rules

<table>
<thead>
<tr>
<th>Rule name</th>
<th>Matches in training pairs</th>
<th>Matches in data sample</th>
<th>Last updated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact_set/First_name/Birth_date</td>
<td>45</td>
<td>12,345 (5.6%)</td>
<td>24.6.2019, 13:35</td>
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<tr>
<td>Domain Customers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Last_name+Phone+Address</td>
<td>5</td>
<td>345 (2.6%)</td>
<td>24.6.2019, 13:35</td>
</tr>
<tr>
<td>Domain Customer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product_name+product_label</td>
<td>1</td>
<td>45 (0.6%)</td>
<td>24.6.2019, 13:35</td>
</tr>
<tr>
<td>Domain Product</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone+Email</td>
<td>45</td>
<td>56,345 (45.6%)</td>
<td>15.6.2019, 10:05</td>
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<tr>
<td>Domain Customer</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Phone+Email</td>
<td>55</td>
<td>89,345 (65.6%)</td>
<td>15.6.2019, 10:05</td>
</tr>
</tbody>
</table>
Selected Customers
ATACCAMA ONE | Platform Capabilities

**COLLABORATIVE DATA STEWARDSHIP UI**
AI & Machine Learning – Self-Service – Collaboration – UX/UI

**ROBUST DATA PROCESSING ENGINE**
Any Data / Any Domain – Integration – Performance – Scalability

**ENTERPRISE-PROVEN CAPABILITIES**
High Availability – Auditing – Identity Management – Data Lineage
From Augmented to Self-Driving Data Management
Self-Driving Data Management

**Augmented** in every use case by additional information, suggestions, guidance etc.

**Autonomous** self-configuration, deployment, operation, tuning

**Automated** as little user input as possible, with built-in Data Management and Data Governance processes and best practices

**Self-learning** from data, metadata, and user actions

**Self-service UI** across all management and governance use cases complemented by powerful, technical IDE for the most demanding technical configuration
Ataccama ONE 2.0 | A Use Case Illustration

Scan & Catalog ➔ Find ➔ Understand ➔ Ensure quality Transform Integrate Master ➔ Use
<table>
<thead>
<tr>
<th>Name</th>
<th>Access</th>
<th>Credentials</th>
<th>Terms</th>
<th>Owner</th>
<th>Last Import</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRM</td>
<td></td>
<td></td>
<td>Product Customer GDPR</td>
<td>Lucinda Ramsey</td>
<td>2 weeks ago</td>
</tr>
<tr>
<td>Politic party full</td>
<td></td>
<td></td>
<td>Product Customer</td>
<td>Anna Fall</td>
<td>23.4.2018</td>
</tr>
<tr>
<td>Credit cards</td>
<td></td>
<td></td>
<td>Customer Products related data</td>
<td>Sergio Pliego</td>
<td>a week ago</td>
</tr>
<tr>
<td>One MDM portal</td>
<td></td>
<td></td>
<td>Product Customer</td>
<td>Gibby Radki</td>
<td>23.4.2018</td>
</tr>
</tbody>
</table>
Basic information

A business perspective of the data source. It can refer to business purpose, department, location or to a particular user group. It should capture the organization of data sources in your company.

Name your data source *
ERP - Berlin

Create
Create new data source without any follow-up action, which can be done manually later.

Create & Import
Import all metadata to the Data Catalog without accessing any data.

Create & Discover
Quick, perfect for the data discovery. Runs on the sample of the data.

Create & Document
Import metadata, run quick data discovery and efficiently profile and validate data quality of all relevant assets.

Create & Document

Create Another
Documented Catalog Items Over the Time

No Items documented

Catalog Items are documented during the import.

Detected Glossary Terms

No Terms Detected

Glossary terms are detected as a part of the profiling.

General Information

Enterprise resource planning (ERP) is the integrated management of main business processes, often in real time and mediated by software and technology.

Owner: David Kolinek
Last import: process in progress
Created at: 7/3/2020
Enterprise resource planning (ERP) is the integrated management of main business processes, often in real time and mediated by software and technology.

Owner: David Kolinek
Last import: process in progress
Created at: 7/3/2020
Data Catalog

- **Party full**
  - CRM > Customers > Starbucks
  - GDPR, Customer, Outlier, Enum, Pattern
  - 1273 entries
  - Virgie Castillo, profiled a week ago

- **Flight_transactions**
  - CRM > Customers > Starbucks
  - Looks like a table with a GDPR content.
  - 29100 entries
  - Dustin Francis, Profile

- **party_full_export**
  - CRM > Customers > Starbucks
  - 6666 entries
  - Francis Medina, Profile

- **party_transformed**
  - CRM > Customers > Starbucks
  - Looks like a table with a GDPR content.
  - 4607 entries
  - Jimmy Farmer, hasn't been profiled

- **Orders nov_19**
  - CRM > Customers > Starbucks
  - GDPR, Customer, Outlier, Enum, Pattern
  - 23077 entries
  - Myrtie Nelson, profiled a week ago

- **Flight_cancellation**
  - CRM > Customers > Starbucks
  - GDPR, Customer, Outlier, Enum, Pattern
  - 45222 entries
  - Aaron Richa, profiled a week ago
Looks like a table with GDPR content.

party_full_export
CRM > Customers > Starbucks

party_transformed
CRM > Customers > Starbucks

Orders_nov_19
CRM > Customers > Starbucks

Flight_cancellation
CRM > Customers > Starbucks
<table>
<thead>
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<th>Description</th>
<th>Users</th>
<th>Profile</th>
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<tr>
<td>ERP - Berlin</td>
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<td>Virgie Castillo</td>
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<td>CRM</td>
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<td>ONE MDM Portal</td>
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<td>Dustin Francis</td>
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<td>PostgreSQL DEV Test</td>
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<tr>
<td>party_full_export</td>
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<td>Francis Medina</td>
<td>Profile</td>
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<td>party_transformed</td>
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<td></td>
<td>Aaron Richa...</td>
<td></td>
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Data Catalog

Looks like a table with GDPR content.

party_full_export
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- 6666
- Francis Medina (Profile)

party_transformed
- CRM > Customers > Starbucks
- 4607
- Jimmy Farmer (hasn’t been profiled)

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- Aaron Richa... (Profile)
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<th>Personal address</th>
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<tr>
<td>Frederick Gardner</td>
<td>Software tester</td>
<td>$ XXX</td>
<td>Canada 1234567890</td>
</tr>
<tr>
<td>Louise Hudson</td>
<td>UX designer</td>
<td>$ XXX</td>
<td>USA 9876543210</td>
</tr>
<tr>
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<td>Alma Vega</td>
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<td>Name</td>
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<td>20/01/2020</td>
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<td>Restrict access to personal data</td>
<td>20/01/2020</td>
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<tr>
<td>Restrict access to SPI data</td>
<td>20/01/2020</td>
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<tr>
<td>Protect employees data</td>
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<td>Protect customers data</td>
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<td>Protect financial data</td>
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<td>Restrict access to data for external users</td>
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<td>Bank Secrecy Act (BSA)</td>
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<tr>
<td>USA PATRIOT Act</td>
<td>20/01/2020</td>
<td></td>
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</tr>
</tbody>
</table>
Restrict access to personal data

Description
Personally identifiable information (PII) is data which can be used to identify, locate, or contact an individual and includes information like name, date of birth, place of residence, credit card information, phone number, race, gender, criminal record, age, and medical records. Every organization stores and uses PII, be it information on their employees or customers. Even schools and universities will store the PII of their students, while hospitals will store patient data.

Policy enforcement
- Last time enforced: 13/01/2020
- Total: 69

Restrict access
Message 'Assets are hidden because of the GDPR regulation'

When
- Asset type
- Is
- Catalog item

And
- Term assigned
- to this asset
- is any of
- PII
- SPI
- Sensitive

And
- User role
- is not
- Risk
- Mark Brown

Regulations
- GDPR
- Regulation on the protection of natural persons with regard to the processing of personal data and on the fr...
  - 13 policies

- CCPA
  - CCPA defines personal information as information that identifies, relates to, describes, is reasonably capable of being associated with, or could ...
<table>
<thead>
<tr>
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<td>$ XXX</td>
<td>USA XXXXXXXX XXX</td>
</tr>
</tbody>
</table>
Data Quality Overview

Last evaluated at 9/16/2020

Records: 1,450,357
DQ Checks: 19
Attributes: 13

- Completeness: 89%
- Validity: 63%
- Uniqueness: 70%
- Accuracy: 66%

Overall Quality: 67.8%

Glossary terms
- PII
- Citizen
- Name
- Date of birth
- Gender
- First name

Insights
- Anomalies detected in attribute birth_date
  - NULL, N/A, and 1900-01-01 are outliers. Apply automatic cleansing before using this data.

- Unexpected customer type distribution
  - Detected based on previous 14 versions of the profile

Attributes summary
- Name
- src_primary_key
- Terms
- Party_full.csv
- GDPR policy
- Party_full
- Party_full_QA
Loyalty Program / Account / Account ID

2 Critical Issues Found

Structure Checks
- 2 Checks
  - 0/2 Passed

Anomaly Detection
- Applied
  - 0/20 Passed

DQ Alerts
- 2 Checks
  - 2/2 Failed

Validity Overall
- 6 Checks
  - Green: 4, Red: 2

Evaluation Rules

Mandatory
- Valid

Data Type
- Valid

Completeness
- Dimension Name
  - 20% 3499 records
  - 28.92% 1240 records

Anomaly

The record of the transaction is stored. The format of the transaction can be data (to be stored in a database), but it can also be a document.
Ataccama ONE 2.0 | A Use Case Illustration

Scan & Catalog → Find → Understand → Ensure quality Transform Integrate Master → Use
Provide contacts of all non-US customers with credit products

Insight:
- Attribute123 looks like reference data in Ataccama DB
- Enrich Customer model with Google Analytics

My Charts:
- 89.21% Customer DQ
- +13 PII
- 34 data sources (+2)
- 12,349 attributes (+12)

Waiting for approval:
- DQM-124. New reference data in "Product validation" rule
- RDM-34. Consolidation of "Product Division" reference data
- DQM-124. New reference data in "Product validation" rule
- CAT-456. Remove "Test" data source
- DQM-124. New reference data in "Product validation" rule

Work in Progress:
- Master Address: 2 hours ago
- Party model: 1 day ago
- Transactions: 1 day ago
- Ataccama Eye: 1 day ago
- "Product type validation" rule: 2 days ago
Search results

Provide contacts of all non-US customers with credit products
Glossary terms:
- Pi, Citizen, Name, Date of birth, Email, Contact, SIN, Gender, First name

Data Quality Overview:
- Last evaluated at 9 16/02/2020
- Records: 1,450,357
- DQ Checks: 19
- Attributes: 13
- Completeness: 89%
- Validity: 63%
- Uniqueness: 70%
- Accuracy: 66%

Insights:
- Anomalies detected in attribute birth_date
- NULL, N/A, and 1900-01-01 are outliers.
- Apply automatic cleansing before using this data.
  - 3 outlier values detected in given attribute

Unexpected customer type distribution:
- Detected based on previous 14 versions of the profile

Relations:
- Parent of: Party_full.csv
- Governed by: GDPR policy
- Transformed items: Party_full
- Environments: Party_full_QA
## From Augmented to Self-Driving, examples

<table>
<thead>
<tr>
<th>Profiling &amp; Data Discovery</th>
<th>Manual</th>
<th>Augmented</th>
<th>Self Driving</th>
<th>Self driving – platform level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Basic statistics</td>
<td>Domains detection, Automated tagging… relationship discovery</td>
<td>Fully automated metadata discovery, including basic DQ information</td>
<td>Data Management and Data Governance best practices leveraged in the form of „expert system“</td>
</tr>
<tr>
<td>Metadata Management</td>
<td>Metadata used to document data and processes</td>
<td>Metadata used to inform/augment processes</td>
<td>Fully operationalized</td>
<td>Platform itself suggesting/configuring use case based on the best practices and required outcome</td>
</tr>
<tr>
<td>Data Quality</td>
<td>Business rules implemented as SQL, ETL, …</td>
<td>Rules suggestion, pattern based DQ, anomaly detection</td>
<td>Autonomously applied rules, pattern based DQ</td>
<td>Learning from user actions to further improve on the DM/DG best practices</td>
</tr>
<tr>
<td>Master Data Management</td>
<td>Technical analysis, data sources mapping, rule based matching</td>
<td>Data sources semi automatically mapped, AI based matching</td>
<td>Autonomous identification and configuration of master data hub</td>
<td>Data Governance policies “always on”</td>
</tr>
<tr>
<td>Data Integration</td>
<td>Single or multiple use case integration processes implemented based on business and technical analysis</td>
<td>Smart, metadata based integration processes, leveraging relationship discovery,… Standalone Data Preparation</td>
<td>Semi-autonomous configuration and deployment of data integration processes, Seamlessly integrated Data Preparation</td>
<td>Omnipresent, fully integrated Data Governance</td>
</tr>
<tr>
<td>Data Preparation</td>
<td>Single environment at a time</td>
<td>Multiple and multi deployment options, performance tuning suggestions,…</td>
<td>Automated, dynamic deployment on suitable environment, performance optimization, …</td>
<td></td>
</tr>
<tr>
<td>Deployment &amp; Operation</td>
<td></td>
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</tr>
</tbody>
</table>
Automated (and therefore embedded) Data Governance
Agile Governance and Governed Agility

Agile teams working with prefer using governed (data) assets as it is be easier for them and they get better results, faster.

For data or processes set up the “quick and dirty way”, Ataccama ONE will identify the assets that need to be governed, and will initiate governance process, automatically.

Establishing, enforcing, monitoring Data governance is easier and more effective, because of augmentation, automation and AI.

Eventually, data governance policies, principles, processes becomes all-pervasive, implicit feature of the (agile) environment.
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Questions?