

PII Oracle

# Database Data Masking

**ORACLE®**

**DATABASE**



 **dataZense™** Whitepaper

# Objective



This paper provides an insight into Best Practices for protecting and securing the Oracle Database sensitive PII data by implementing the Data Profiling and Data Remediation solution, thereby assuring the companies to ensure compliance with the GDPR, SOX Compliance and similar data privacy laws worldwide and maximize the business value.



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Senior Enterprise Architect in ChainSys with 20+ years of experience specialized in Data Security and Compliance. Heavily engaged with the Global Clients to secure their sensitive data. Published several ML Algorithms for sensitive data identification and remediation. My current focus areas are Data Security and Compliance, Data Migration, Data Integration, Big Data, Master Data Management, Business Intelligence and Artificial Intelligence.

PII Oracle

# Database Data Masking

## BUSINESS EXPECTATIONS

Personal information or Personally identifiable information (PII) is any data that could potentially identify a specific individual. No company can claim 100% compliance, but they have to make "Good Faith Effort" to cover most of the ground. The new rules grant people more rights regarding how companies handle their personally identifiable information (PII), and it imposes heavy fines for non-compliance and data breaches--up to 4 percent of a company's yearly revenue.

For security teams, this means making sure that PII is adequately protected and that the proper reporting processes are in place. Companies are at high risk of significant fines, data breach, brand reputation, and potential loss of customers if they do not mitigate the risk of adhering to the proper compliance levels in all regions.

Making 'Zense' of data is a challenge for most companies. dataZense is an end-to-end analytics platform that integrates all of your company's data, secures it, and brings it to life through easy-to-use Dashboards. The Data Catalog helps look for needed data in an organization. dataZense® provides an end-to-end capability for Data Profiling, Data Remediation (Masking, Scrambling, and Encryption), and Data Governance.



# PII Data Categories

Personal data are grouped in to two different categories Critical and Confidential Data Elements or Categories.

## Critical Data Elements/Categories

Critical data elements are those elements by which you can directly identify individual/person such as their social security number, National Identifier, Visa Number, Passport Number, Employee Number etc.

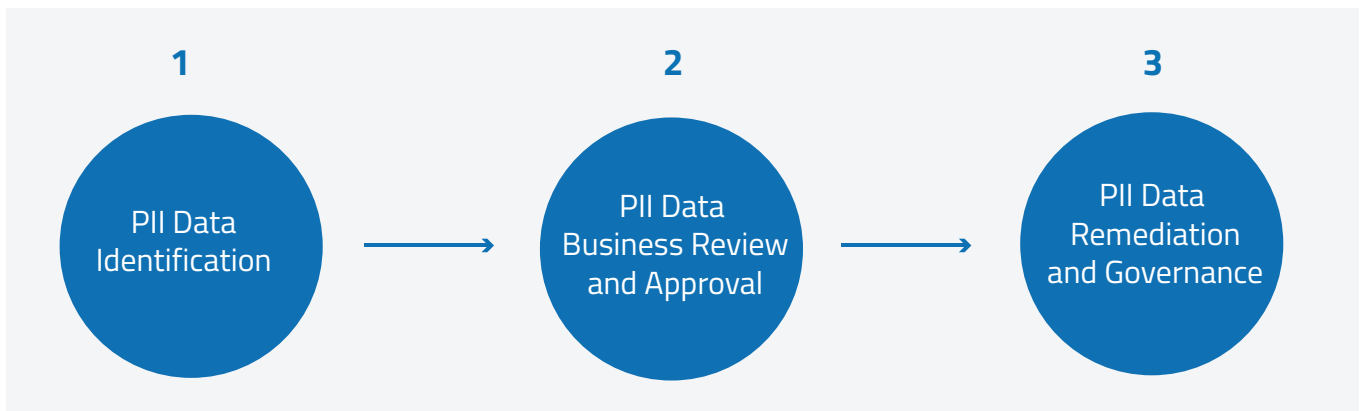
## Confidential Data Elements/Categories

Confidential data elements are information which when combined other personal data elements can able to identify individual. E.g.: First name, Last Name, Date of Birth.

## Oracle Database PII Data Profiling and Data Masking

The PII Data Profiling and Data Masking within the dataZense application is broken out into the following three high level process

- PII Data Identification
- PII Business Review and Approval
- PII Data Remediation and Governance



### PII Identification

Identify Systems considered for Sensitive Data Identification (PII) and run the Data profiling process to identify the PII Attributes. Provides the complete visibility of the identified PII data. i.e., Server, Instance, Database, Schema, Table, Column level details.

### PII Business Review and Approval

The identified PII attributes will go through False-Positive / False-Negative analysis and approved for remediation

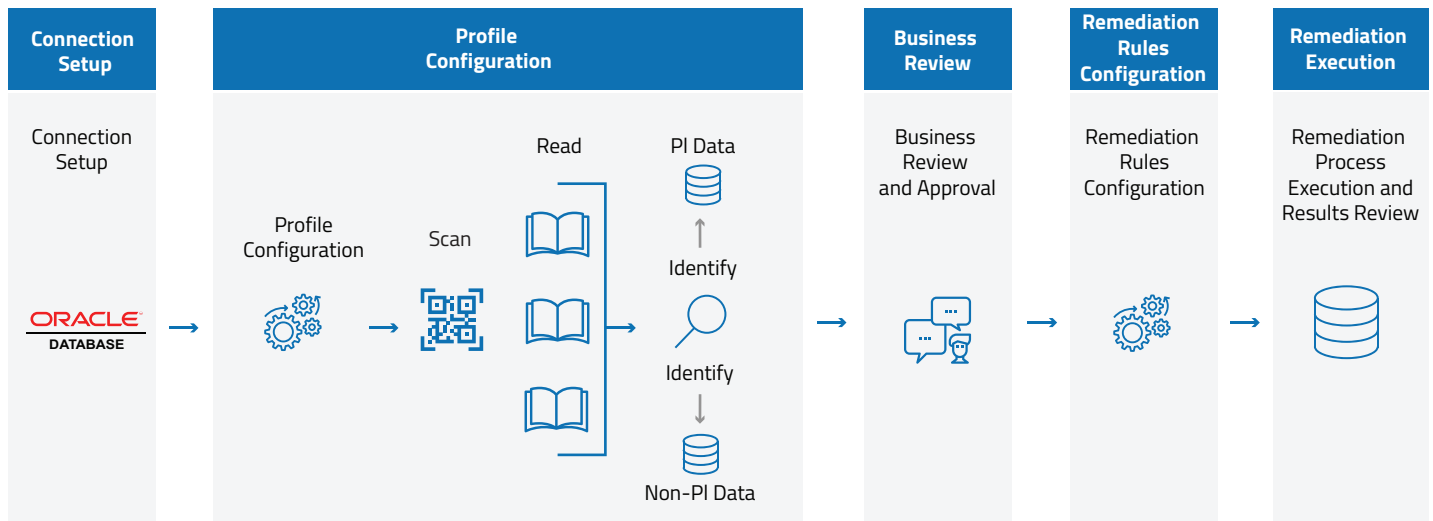
### PII Remediation and Governance

The business approved PII attributes will be considered for remediation.

## Remediation Options:

- Scramble the Data
- Mask the Data
- Remove Data (With capture of logs) – remove from all production and non-production environments
- Keep the Data (Encrypt in all Non-Production environments)

## High Level Architecture



## Data Masking Process Steps

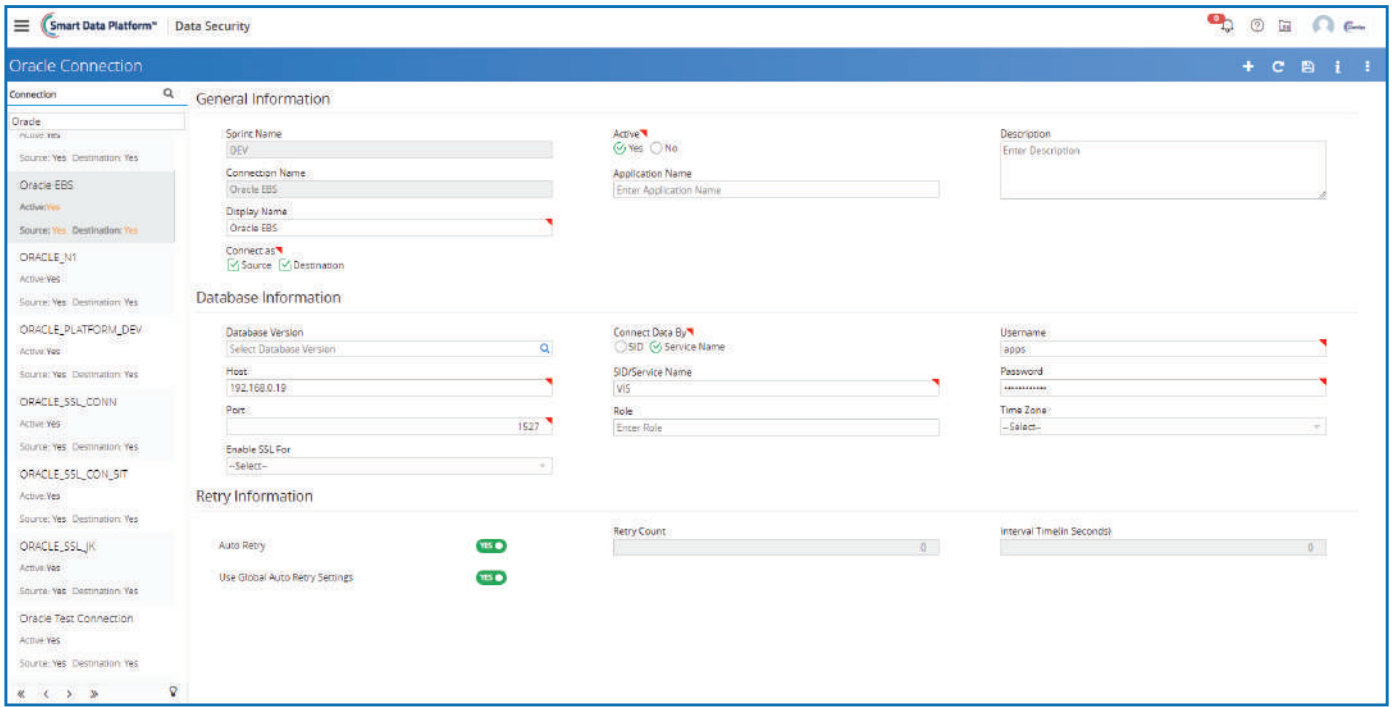
### Steps to configure:

- Create a Connection to the Oracle Database
- Create a Data Security profile for scanning the Oracle Database.
- Business Review of scanned results and complete the Business validation of Approve/Reject the PII Data.
- Create a Remediation Profile to configure the Remediation Rules for masking the data.
- Execute the configured Remediation Profile to mask the data and Review the masked results from the Oracle database.

# Connection

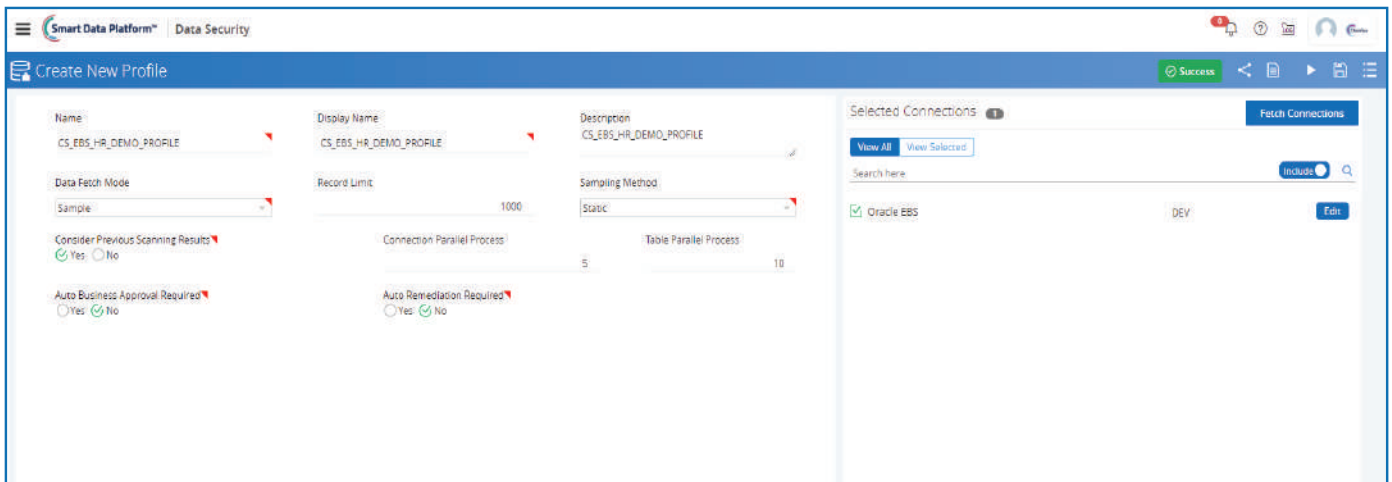
Verifying the Source Connection:

Ensure that the respective Oracle Database connection is available. If not, create a new connection.



# Profile Creation and Execution

Create a profile for scanning the Oracle Database and execute.



# Business Review

Review the scanned results and complete the Business validation by Approving or Rejecting the PII Data

**Business Validation and Approval**

Data Security Profile: CS\_ORACLE\_DEMO\_PROFILE | Execution Details: 10/27/2020 15:40:32 PM | Connections: ORACLE

Schema Name: SYSTEM | Table Name: CP\_EMPLOYEE\_DETAILS | Status: Pending

Server Name: ORACLE | Instance Name: ORACLE | Database Name: ORACLE

Table Name	Column Name	Possible Category	Match(%)	Category Name	Status	Sample	Notes
CP_EMPLOYEE_DETAILS	STATE	STATE_OR_PROVINCE	100	STATE_OR_PROVINCE	Pending	View Data	Note
CP_EMPLOYEE_DETAILS	LEGAL_NAMES	NAME	87	NAME	Pending	View Data	Note
CP_EMPLOYEE_DETAILS	NATIONAL_IDENTIFIER	NATIONALIDENTIFIER	100	NATIONAL_IDENTIFIER	Pending	View Data	Note
CP_EMPLOYEE_DETAILS	ADDRESS_1	LOCATION	29	ADDRESS	Pending	View Data	Note
CP_EMPLOYEE_DETAILS	COUNTRY	COUNTRY	100	COUNTRY	Pending	View Data	Note
CP_EMPLOYEE_DETAILS	CHILDREN_NAME	NAME	80	NAME	Pending	View Data	Note
CP_EMPLOYEE_DETAILS	ADDRESS_2	MONEY	4	MONEY	Pending	View Data	Note
CP_EMPLOYEE_DETAILS	PARENTS_NAME	NAME	87	NAME	Pending	View Data	Note
CP_EMPLOYEE_DETAILS	FIRST_NAME	NAME	94	NAME	Pending	View Data	Note
CP_EMPLOYEE_DETAILS	TOWN	CITY	40	CITY	Pending	View Data	Note

# Remediation Profile

Create a Remediation Profile to configure the Remediation Rules for masking the data

**PII Remediation Profile Lookup Setup**

PII Remediation Config: CS\_PII\_REMEDIATION\_PROFILE

Category Rule: 99 Total

Category	Category Type	Security Level	Remediation Type	Mask/Scramble Type
<input checked="" type="checkbox"/> CLIENT APPLICATIONS AND OS	STRING	Confidential	Scramble	NA
<input checked="" type="checkbox"/> CONTACTS	STRING	Confidential	Scramble	NA
<input checked="" type="checkbox"/> CONTACTS COMMUNICATIONS	STRING	Confidential	Scramble	NA
<input checked="" type="checkbox"/> CORPORATIONS	STRING	Confidential	Scramble	NA
<input checked="" type="checkbox"/> COUNTRY	STRING	On the Record	Scramble	NA
<input checked="" type="checkbox"/> CREDIT CARD	CREDIT CARD	Critical	Mask	KEEP_LAST4
<input checked="" type="checkbox"/> CREDIT CARD NUMBER	CREDIT CARD	Critical	Mask	KEEP_LAST4
<input checked="" type="checkbox"/> CURRENT ADDRESS	STRING	Confidential	Scramble	NA
<input checked="" type="checkbox"/> DATE	DATE	Confidential	Mask	DAY
<input checked="" type="checkbox"/> DATE OF BIRTH	DATE	Confidential	Mask	DAY
<input checked="" type="checkbox"/> DATE OF DEATH	DATE	Confidential	Mask	DAY
<input checked="" type="checkbox"/> DEVICE IP	IP ADDRESSES	Confidential	Delete	NA
<input checked="" type="checkbox"/> DIGITAL RECORDS OF PHYSICAL	STRING	Confidential	Scramble	NA
<input checked="" type="checkbox"/> DISABILITY	STRING	Confidential	Scramble	NA

# Remediation Execution

Execute the configured Remediation Profile to mask the data.

**Remediate by Configured Profiles**

Configuration Profile Name: CS\_PII\_REMEDIATION\_PROFILE | PII Category Type: Equals

Search | Clear | Minimize

**Results** 1 Records Remediate Selected

Configuration Profile Name	Description	PII Categories	Databases
CS_PII_REMEDIATION_PROFILE	CS_PII_REMEDIATION_PROFILE	22	7

# Remediation Process Status

**Remediation Process Status**

Category Name: ACADEMIC.ACADEMIC CERTIFICATE N | Region: Region | Country: Country | Location: Location

Remediation Status: Completed | Instance: Instance | Database: Database | Schema Name: Schema Name

Search | Reset

Remediation Profile Name	Server Name	Instance	Database	Schema Name	Table Name	Column Name	Category	Remediation	Status	Log
CS_ORACLE_DEMO_PROFILE	ORACLE	ORACLE	ORACLE	SYSTEM	CP_EMPLOYE...	EMAIL_ADDR...	EMAIL	Mask	Completed	
CS_ORACLE_DEMO_PROFILE	ORACLE	ORACLE	ORACLE	SYSTEM	CP_EMPLOYE...	NATIONAL_I...	NATIONAL.ID...	Mask	Completed	
CS_ORACLE_DEMO_PROFILE	ORACLE	ORACLE	ORACLE	SYSTEM	CP_EMPLOYE...	FIRST_NAME	STRING	Scramble	Completed	
CS_ORACLE_DEMO_PROFILE	ORACLE	ORACLE	ORACLE	SYSTEM	CP_EMPLOYE...	LAST_NAME	STRING	Scramble	Completed	
CS_ORACLE_DEMO_PROFILE	ORACLE	ORACLE	ORACLE	SYSTEM	CP_EMPLOYE...	ADDRESS_1	STRING	Scramble	Completed	
CS_EBS_PII_REMEDIATION_PR...	ORACLE	ORACLE	HR	HR	PER_ALL_PE...	EMAIL_ADDR...	EMAIL	Mask	Completed	
CS_EBS_PII_REMEDIATION_PR...	ORACLE	ORACLE	HR	HR	PER_ALL_PE...	NATIONAL_I...	NATIONAL.ID...	Mask	Completed	
CS_EBS_PII_REMEDIATION_PR...	ORACLE	ORACLE	HR	HR	PER_ALL_PE...	FIRST_NAME	STRING	Scramble	Completed	
CS_EBS_PII_REMEDIATION_PR...	ORACLE	ORACLE	HR	HR	PER_ALL_PE...	LAST_NAME	STRING	Scramble	Completed	
CS_EBS_PII_REMEDIATION_PR...	ORACLE	ORACLE	HR	HR	PER_ALL_PE...	FULL_NAME	STRING	Scramble	Completed	
CS_SALESFORCE_DEMO_PROF...	ORACLE	ORACLE	SF_DEMO	SF_DEMO	CP_CONTACT...	EMAIL_ADDR...	EMAIL	Mask	Completed	
CS_SALESFORCE_DEMO_PROF...	ORACLE	ORACLE	SF_DEMO	SF_DEMO	CP_CONTACT...	NATIONAL_I...	NATIONAL.ID...	Mask	Completed	



# Review Masked Results

Review the masked results from the Oracle database.

Worksheet Query Builder

```

1 select * from cp_employee_details
2
3
4

```

Query Result x

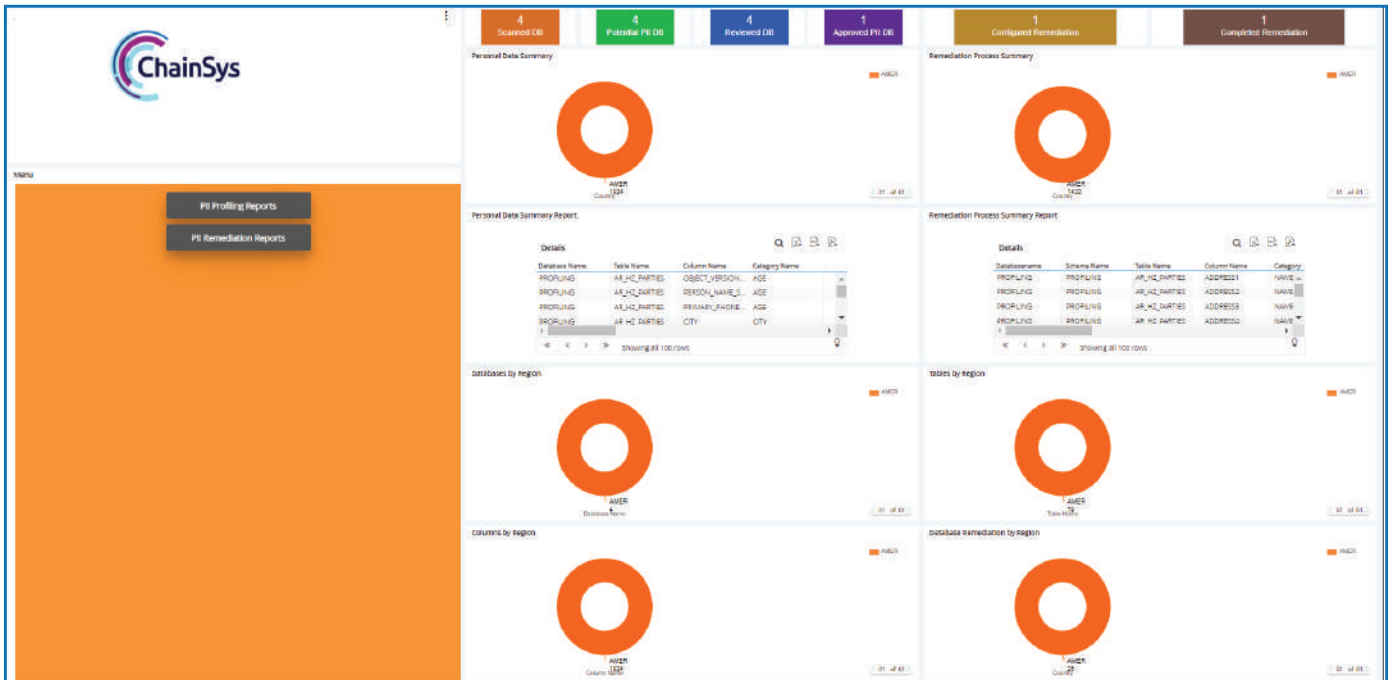
SQL | Fetched 50 rows in 0.552 seconds

	FIRST_NAME	LAST_NAME	VISA_NUMBER	WORK_PERMIT_NUMBER	LICENSE_NUMBER	FULL_NAME	NATIONAL_IDENTIFIER	ITIN_NUMBER	BANK_ACCOUNT_NO
1	OVxHf	nCkpP	H123870425	3450678-2666	102202A301309	Baker, Mr. David	XXX-56-5454	255-67-6791	0005-001-2-1000002
2	zppq1tJ	ITJyeBJC	H123870426	3450678-2667	102202A301310	Lamoreux, Mr. Maxwell D	XXX-30-4059	255-67-6792	47833-89
3	Yz7mz	BGFHcUP	H123870427	3450678-2668	102202A301311	Saliers, Ms. Emily M	XXX-48-0198	255-67-6793	12345-09
4	3R0Z	vgaGrhE6	H123870428	3450678-2669	102202A301312	Strogoff, Karl A.	XXX-32-3232	255-67-6794	1234567
5	EwI9F	rgJ0hq2FU	H123870429	3450678-2670	102202A301313	Gallagher, Ms. Nancy S	XXX-34-9845	255-67-6795	45678-098
6	GcAw1tRiX	vQBKcG	H123870430	3450678-2671	102202A301314	Mavery, Ms. Elizabeth	XXX-32-3232	255-67-6796	220489-12-1328
7	pdAT	LCV80Ivm	H123870431	3450678-2672	102202A301315	Palmieri, Ms. Lisa G	XXX-83-7765	255-67-6797	220489-12-1809
8	hhFr	xEslbj92l	H123870432	3450678-2673	102202A301316	Bernstein, Ms. Kira A	XXX-22-9485	255-67-6798	220489-12-3908
9	OVxHf	w54T09R	H123870433	3450678-2674	102202A301317	McManus, Mr. David C.	XXX-48-0191	255-67-6799	0401-456-9-1234
10	93q3U	pMDF0	H123870434	3450678-2675	102202A301318	Franz, Peter R	XXX-09-3945	255-67-6800	1234556-0234
11	pszj6	ccNxhAWc	H123870435	3450678-2676	102202A301319	Andretti, Mr. Evan	XXX-43-4343	255-67-6801	2468246
12	p4cJ5oa	D2XyDi	H123876998	3450678-9554	102202A301320	William, Putnam	XXX-45-8432	255-67-0733	123456789665
13	trU	GbXYf	H123876999	3450678-9555	102202A301321	Ira, Smith	XXX-45-8433	255-67-0734	123456789666
14	PwJ19ar	dH4Y1rpX	H123877000	3450678-9556	102202A301322	Deanna, Demarest	XXX-45-8434	255-67-0735	123456789667
15	tWROsX	r0pd0	H123877001	3450678-9557	102202A301323	Connor, Morae	XXX-45-8435	255-67-0736	123456789668
16	bS20f	jn0V	H123876508	3450678-9064	102202A301324	Sahar, Abdi	XXX-45-7942	255-67-0243	123456789175
17	LSr	7q9xz2	H123876509	3450678-9065	102202A301325	Sam, Hepner	XXX-45-7943	255-67-0244	123456789176
18	p4cJ5oa	s7cIRl	H123876510	3450678-9066	102202A301326	William, Holmes	XXX-45-7944	255-67-0245	123456789177
19	OVxHf	9ETz3E qhNFtElKa	H123876511	3450678-9067	102202A301327	David, Wright Broughton	XXX-45-7945	255-67-0246	123456789178
20	Plq7	mzJ0ppiKv	H123876512	3450678-9068	102202A301328	Dean, Mortenson	XXX-45-7946	255-67-0247	123456789179
21	Tc3qbv	Ehh41en	H123876513	3450678-9069	102202A301329	Daniel, Moffett	XXX-45-7947	255-67-0248	123456789180
22	KYNGP0G	TbIRb	H123876514	3450678-9070	102202A301330	Phillip, Meadow	XXX-45-7948	255-67-0249	123456789181
23	OVxHf	Ff89UL0JaJH	H123876515	3450678-9071	102202A301331	David, Cumberworth	XXX-45-7949	255-67-0250	123456789182
24	RPh2O	GNv8C	H123876516	3450678-9072	102202A301332	Craig, Fomby	XXX-45-7950	255-67-0251	123456789183
25	zBz2L	GxRD9	H123876517	3450678-9073	102202A301333	Jason, Aaron	XXX-45-7951	255-67-0252	123456789184
26	NuUm	Wdad	H123876518	3450678-9074	102202A301334	Glen, Wahl	XXX-45-7952	255-67-0253	123456789185
27	Bnki	prcNxKmT7	H123876519	3450678-9075	102202A301335	Eric, Ryplewski	XXX-45-7953	255-67-0254	123456789186
28	reUKVI	ljsDO	H123876520	3450678-9076	102202A301336	Robert, Sarni	XXX-45-7954	255-67-0255	123456789187
29	W6VB=1j	U180RYCE	H123876521	3450678-9077	102202A301337	Deborah, Stratton	XXX-45-7955	255-67-0256	123456789188
30	hERO	OqTtH	H123876522	3450678-9078	102202A301338	Todd, Sykes	XXX-45-7956	255-67-0257	123456789189

# Dashboards

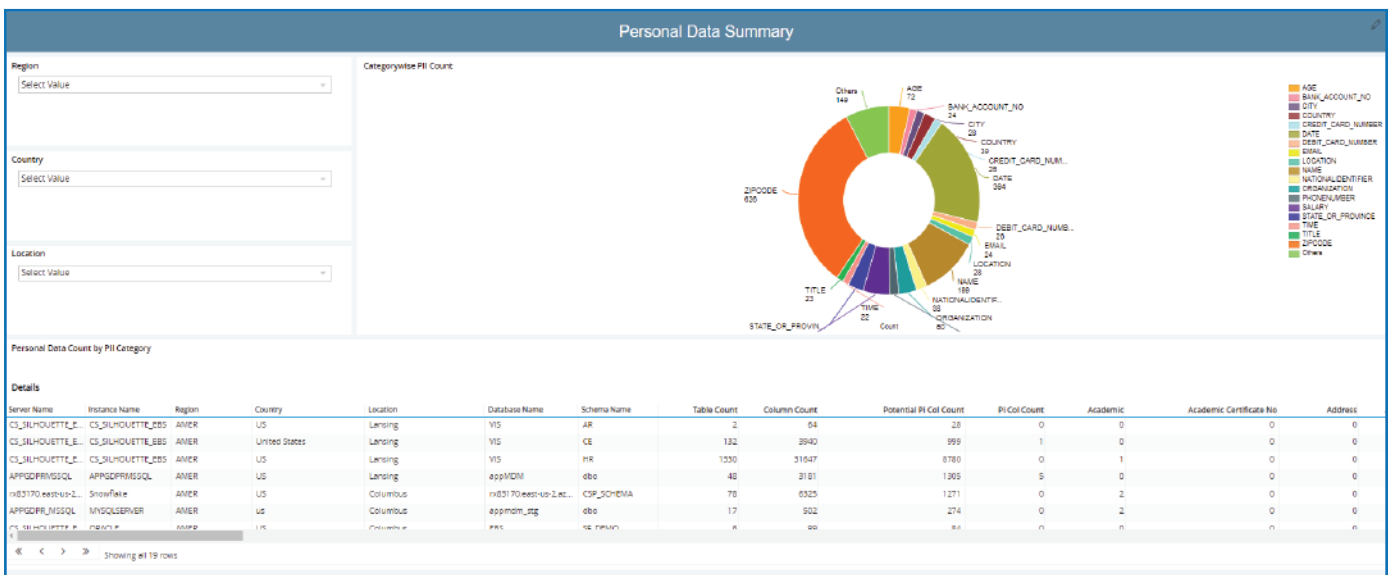
## PII Home Dashboard

Provides the high-level summary of Profiled and Remediated Databases



## Personal Data Count by PII Category

Provides the PII data count by each PII Category



## Supported Endpoints ( Partial )

Oracle Sales Cloud, Oracle Marketing Cloud, Oracle Engagement Cloud, Oracle CRM On Demand, SAP C/4HANA, SAP S/4HANA, SAP BW, SAP Concur, SAP SuccessFactors, Salesforce, Microsoft Dynamics 365, Workday, Infor Cloud, Procore, Planview Enterprise One

Cloud Applications

Oracle E-Business Suite, Oracle ERP Cloud, Oracle JD Edwards, Oracle PeopleSoft, SAP S/4HANA, SAP ECC, IBM Maximo, Workday, Microsoft Dynamics, Microsoft Dynamics GP, Microsoft Dynamics Nav, Microsoft Dynamics Ax, Smart ERP, Infor, BaaN, Mapics, BPICS

Enterprise Applications

Windchill PTC, Oracle Agile PLM, Oracle PLM Cloud, Teamcenter, SAP PLM, SAP Hybris, SAP C/4HANA, Enovia, Proficy, Honeywell OptiVision, Salesforce Sales, Salesforce Marketing, Salesforce CPQ, Salesforce Service, Oracle Engagement Cloud, Oracle Sales Cloud, Oracle CPQ Cloud, Oracle Service Cloud, Oracle Marketing Cloud, Microsoft Dynamics CRM

PLM, MES & CRM

Oracle HCM Cloud, SAP SuccessFactors, Workday, ICON, SAP APO and IBP, Oracle Taleo, Oracle Demantra, Oracle ASCP, Steelwedge

HCM & Supply Chain Planning

Oracle Primavera, Oracle Unifier, SAP PM, Procore, Ecosys, Oracle EAM Cloud, Oracle Maintenance Cloud, JD Edwards EAM, IBM Maximo

Project Management & EAM

OneDrive, Box, SharePoint, File Transfer Protocol (FTP), Oracle Webcenter, Amazon S3

Enterprise Storage Systems

HIVE, Apache Impala, Apache Hbase, Snowflake, mongoDB, Elasticsearch, SAP HANA, Hadoop, Teradata, Oracle Database, Redshift, BigQuery

Big Data

mangoDB, Solr, CouchDB, Elasticsearch

No SQL Databases

PostgreSQL, Oracle Database, SAP HANA, SYBASE, DB2, SQL Server, MySQL, memsql

Databases

IBM MQ, Active MQ

Message Broker

Java, .Net, Oracle PaaS, Force.com, IBM, ChainSys Platform

Development Platform

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End to End

Data Management needs

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Data Integration



Data Quality Management  
Data Governance  
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