

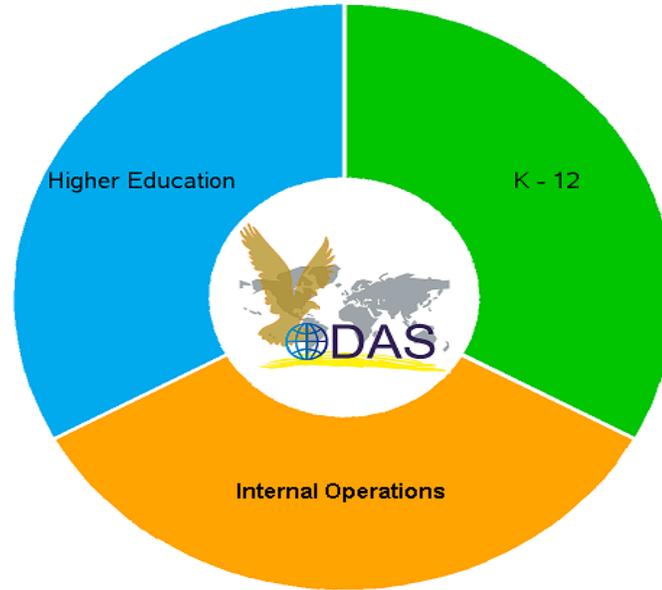


OIG Data Analytics System



System Introduction

ODAS (OIG Data Analytics System) contains intuitive web-based data analytical and risk model systems that support OIG audit and investigative efforts. The data analytics provide investigators with the ability to uncover hidden patterns, relationships and anomalies by sifting through large volumes of data to discover that which is not apparent. The risk models provide early warning indicators identifying emerging risks allowing auditors to integrate results into all aspects of the audit process.



ODAS News & Updates

11/24/2014 - [View PDF file/download from Chrome](#)

Currently, you can't view PDF directly from Chrome. When you double-click on the downloaded PDF file, you received Chrome PDF Viewer is not allowed messages.

In order to view the PDF file, you can startup the Acrobat Reader and go to C:\Users\your name\Downloads\PDF filename to view this file.

Or, you can call ED help desk to change the settings of Chrome plugins.

This system is developed and maintained by CAATs team, OIG, Department of Education.

The Honorable Kathleen S. Tighe

U.S. Department of Education
Inspector General

**Southwest/Southeastern
Intergovernmental Audit Forum**

August 10, 2017

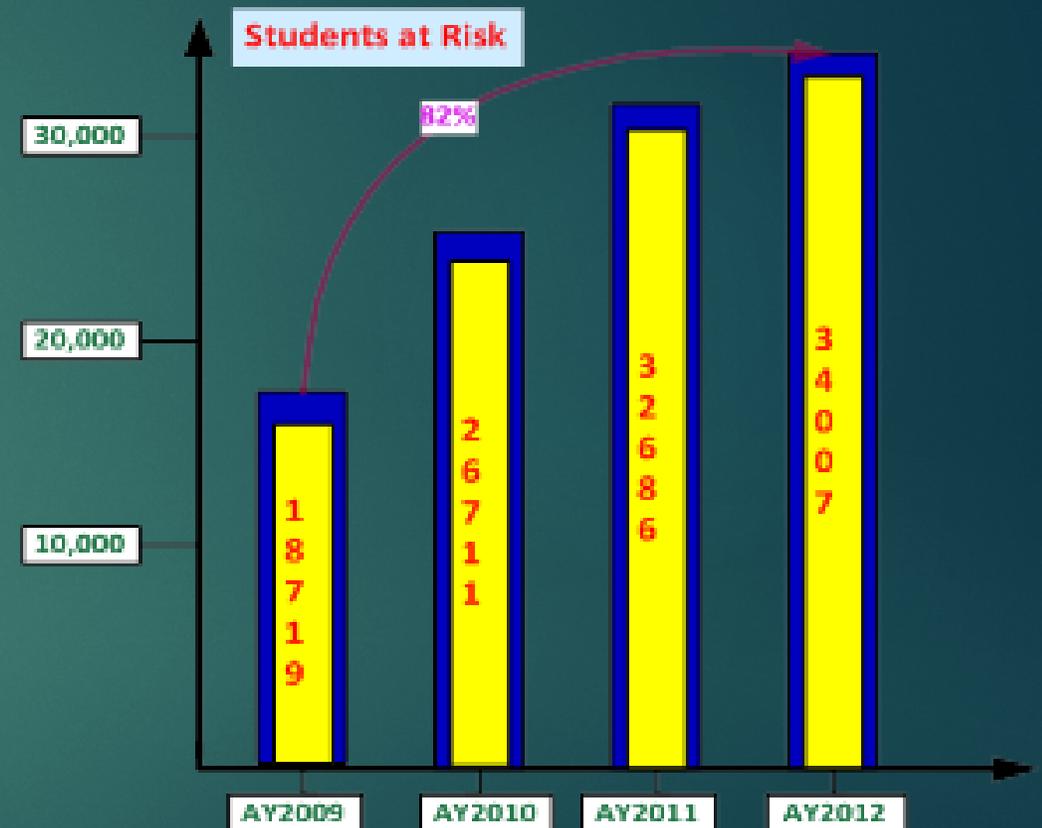
U.S. Dept ED - OIG Auditors - Investigators

- ODAS - Production
- ODAS - Foundation
- ODAS - Development
- ODAS - Planned



Student Fraud Rings (E-Fraud Model)

- ▶ Using this model, which relies on rule-based filters, we found the following:
 - ❑ Student aid fraud ring activity increased 82 percent from award year (AY) 2009 (18,719 students) to AY 2012 (34,007 students)
 - ❑ A total of over 85,000 recipients, who received over \$874 million in Federal student financial aid, may have participated in this type of student aid fraud ring activity.
- ▶ Applying a statistical model, we estimated that \$187 million of this \$874 million in Federal student aid funds was a probable fraud loss.
- ▶ We have used this model to find more fraud rings and additional participants in known fraud rings.



*AY 2012 Effective Through July 31st

FIGURE 3

State & Local Ranking Model

Objective of the State & Local Ranking Model (SLRM)

- ▶ Identify '**evidence of risk**' within State Educational Agencies and local school districts.
- ▶ The SLRM ranking model enhances audit planning and investigation resource management.

Methodology of the SLRM

- ▶ Group similar size school districts and rank them based on weighted scores assigned to selected risk factors.
 - ▶ Groups, risk factors, scores, and weights were agreed to and determined by the SLRM Project Team
 - ▶ School districts split into six groups according to population size.
 - ▶ Risk Factors from six primary sources of data.
 - ▶ Risk factor data transformed into scores ranging from zero to 100.
 - ▶ Scores weighted by multiplying by 1, 2, 3, 4, or 5.
 - ▶ Ranking on a scoring system within each group.
 - ▶ Highest score represents the highest risk school districts in group
- ▶ States ranked by combining all group rankings of school districts within each state.

State & Ranking Model (SLRM)

Map Modify Scoring Table

Selected State(s) and/or Group(s) will be reflected on a Google map for color code visualization.

Update Ranking Model

Reset Everything

Once new variables are selected or modified, the model must be refreshed.

The model can be reset to the original 'default' configuration should the user wish to start over.

Filtering

States All States Select States

Groups All Groups Select Groups

Groups are based on school district student population size.

Baskets Administrative Financial Audit Performance

By default all indicators are stored within one of [4] defined Baskets.

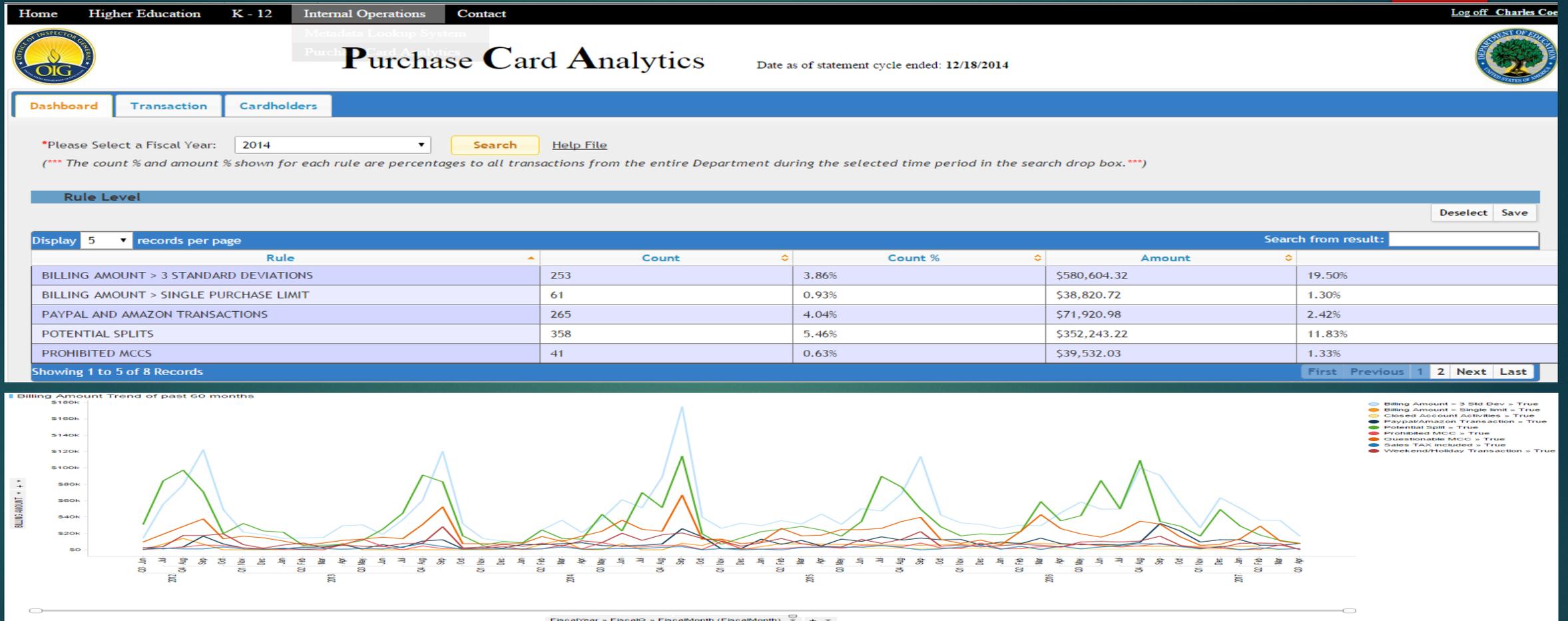
Individual Ranking Indicators

Each indicator weight value can be increased or decreased based on user defined importance.

An indicator can be moved to another Basket or become its own standalone Basket.

#	Name	Description	Weight	Enabled?	Basket	Reset
1	Currently a High Risk Grantee	Grantee is currently listed as being "high risk" by the criteria and process defined in EDGAR parts 74 and 80. The conditions placed on the grantee as a result of the high risk designation are necessary to ensure that the grantee materially complies with the requirements of the grant.	1	Yes	Administrative	Reset
2	Grantee Currently Has a High Risk Award	At least one grant award to a grantee is currently listed as being "high risk" by the criteria and process defined in EDGAR parts 74 and 80.	1	Yes	Administrative	Reset
3	Going Concern Indicated in Disclosure to Financial Statements	Auditor has significant concerns about the auditee's ability to continue operating, being able to realize its assets and discharge its liabilities beyond one year of the financial statement date. Such concerns may arise due to significant risks and uncertainties that raise doubts about the long-term sustainability of current government programs in relation to the resources expected to be available.	1	Yes	Audit	Reset
4	Issued Qualified Opinion on Financial Statements	Auditee is in compliance with laws and regulations governing financial statements with at least one exception. A qualified opinion states that, except for the effects of the matter(s) to which the qualification relates, the financial statements present fairly, in all material respects, the financial position, results of operations, and cash flows of the entity in conformity of GAAP.	1	Yes	Audit	Reset
5	Issued Adverse Opinion on Financial Statements	Auditee is not in compliance with laws and regulations governing financial statements. The financial statements of an auditee are materially misstated and when considered as a whole, do not conform with Generally Accepted Accounting Principles. An adverse opinion states that the financial statement does not present fairly the financial position, results of operations, or cash flows of the entity in conformity with GAAP.	1	Yes	Audit	Reset

Purchase Card Data Analytics



- ▶ Objective: Develop an automated system using data analytic techniques to identify p-card transactions having a high risk of fraud or abuse as well as to assess and identify emerging risk. More specifically, the system aims to provide an automated solution that satisfies the defined oversight responsibilities of the OIG.

Assessment Rules/Indicators

Transaction Level

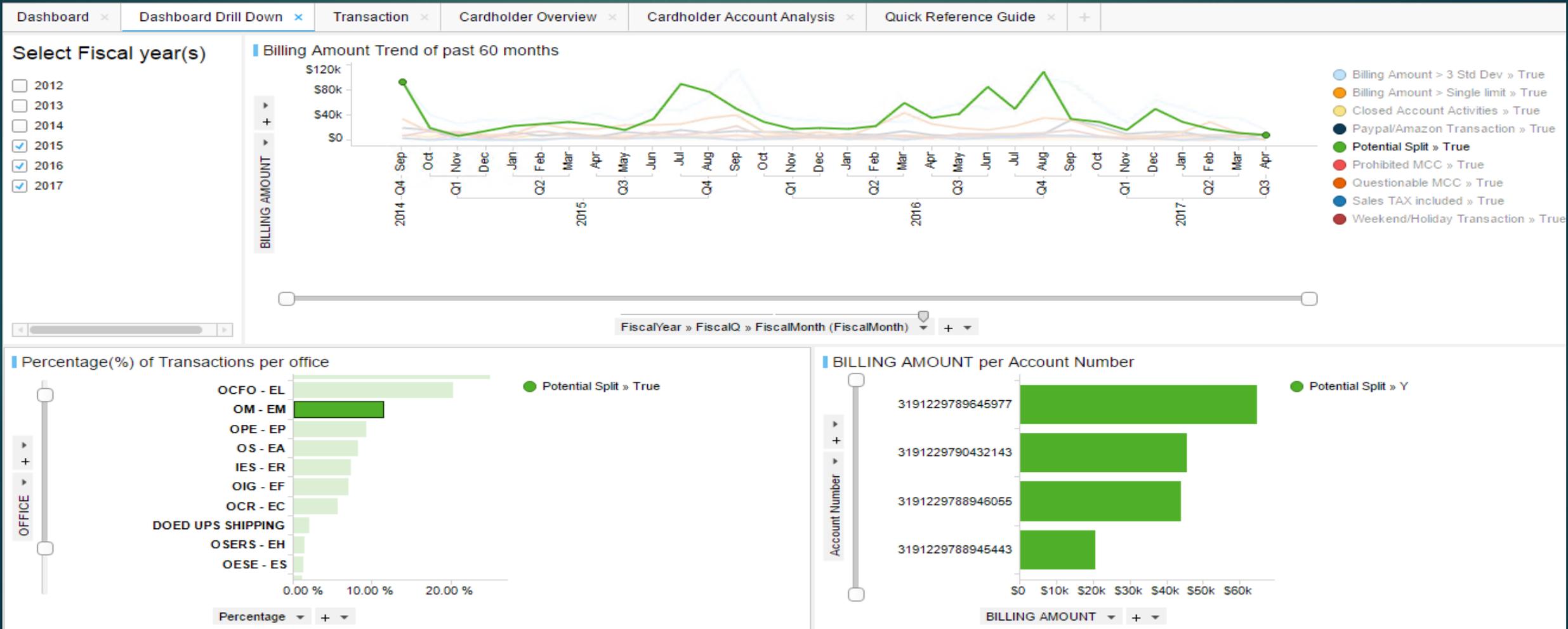
- Billing Amount > 3 Standard Deviation
- Billing Amount > Single Purchase Limit
- Closed Account Activities
- PayPal & Amazon Transactions
- Potential Splits
- Prohibited MCCs (merchant category code)
- Questionable MCCs
- Transactions with Sales Tax
- Weekend/Holiday Transactions

Account Level

- Frequency of Purchasing from Same Vendor
 - ❑ a tool for identifying spending patterns of cardholders and potential fictitious vendors.
- Frequency of Purchasing under Same MCC
 - ❑ a tool for identifying spending patterns of cardholders and potential “problem” cardholders.
- Percentage of Whole Dollar Transactions
 - ❑ a tool for identifying potential suspicious & fictitious transactions.

DASHBOARD DRILL DOWN PAGE

In addition to the line chart showing the aggregate spending trend for the 9 rules, within each rule, users can drill down to see the percentage of number of transaction for each office. Then users can further drill down within an office to see the accounts and their respective spending amount. Also, users can select a fiscal year or multiple fiscal years to view. This page does not provide transaction level data.



TRANSACTION PAGE

User can look up detailed transactions identified under each of the 9 rules by office or all transactions for an office. The 3 bar charts allow users to compare, within a special rule and timeframe, the ranking of offices in terms of (1) the number of accounts in an office, (2) the number of transactions in an office, and (3) the billing total in an office. Users can also drill down to transactions and matching CPSS obligations within an office. Detailed transactions can be exported out for further analysis.

Dashboard
Dashboard Drill Down
Transaction
Cardholder Overview
Cardholder Account Analysis
Quick Reference Guide

Choose rule from the drop down menu:

Prohibited MCC

- Questionable MCC
- Prohibited MCC
- Billing Amt > 3 SD
- Billing Amt > Single Limit
- Closed Acct Activities
- Weekend/Holiday Transactions
- Potential Split
- Sales TAX included
- Paypal/Amazon Transaction
- All Transactions

Total Billing Amount per OFFICE

OFFICE	Total Billing Amount
OS - EA	\$41k
OCO - EO	~\$9k
OIG - EF	~\$7k
OVAE - EV	~\$5k
OM - EM	~\$3k
OII - EU	~\$2k
OSERS - EH	~\$1k
OCR - EC	~\$0.5k

Number of Accounts per OFFICE

OFFICE	Number of Accounts
OM - EM	~3.5
OCO - EO	~2.5
OIG - EF	~2.2
OS - EA	3
OVAE - EV	~2.1
OCR - EC	~1.5
OII - EU	~1.5
OSERS - EH	~1.5

Number of unique Transactions per OFFICE

OFFICE	Number of unique Transactions
OS - EA	56
OCO - EO	~15
OIG - EF	~12
OM - EM	~5
OII - EU	~4
OVAE - EV	~3
OCR - EC	~2
OSERS - EH	~1

VISA Transactions

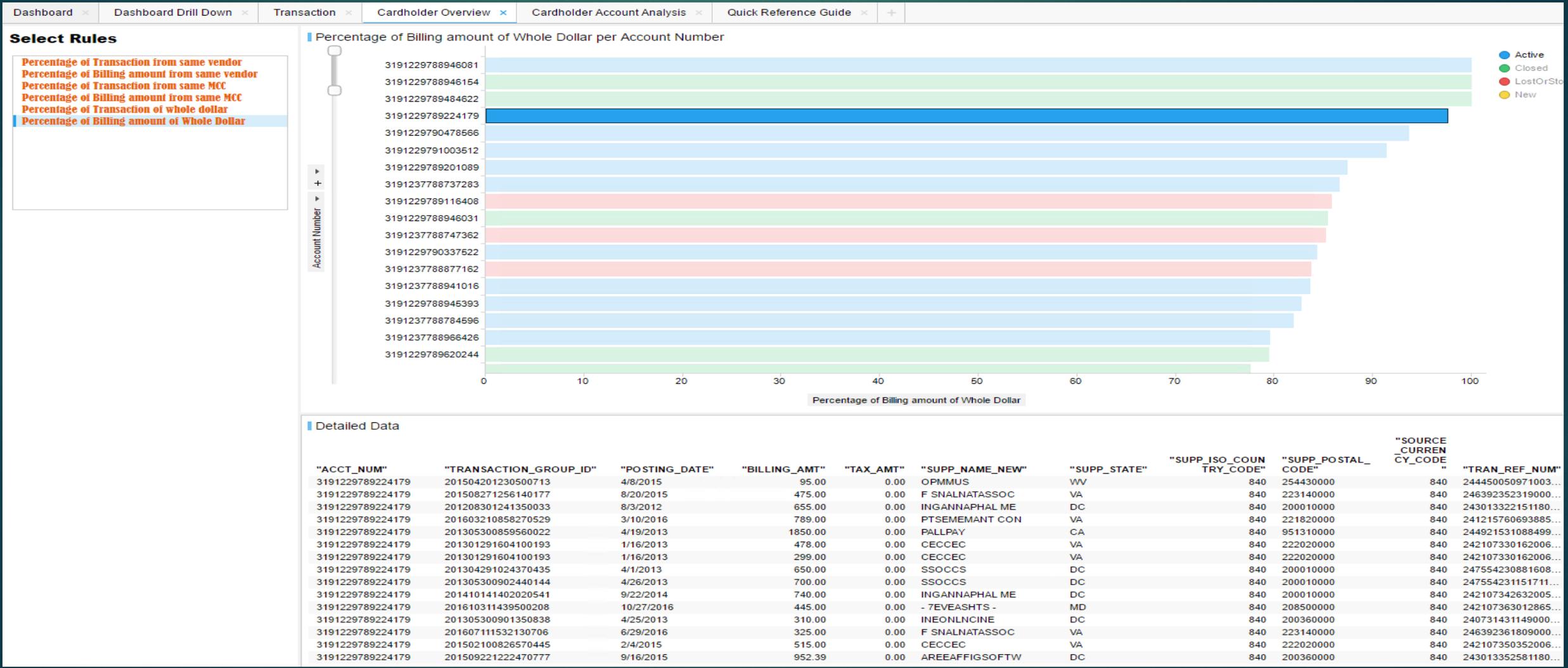
"TRANSACTION_GROUP_ID"	"ACCT_NUM"	"POSTING_DAT..."	"BILLING_AM..."	"TAX_AMT"	"SUPP_NAME_NEW"
201604120848120505	3191229789540747	4/5/2016	287.00	0.00	LESESEDI
201608081152140244	3191229789540747	8/3/2016	458.83	0.00	EADA BPANEAD
201606211345260349	3191229789540747	6/6/2016	1881.90	0.00	ILLIAITHEON CA
201612051211280701	3191237987716442	11/11/2016	466.30	0.00	EADA BPANEAD
201608220847500822	3191229789540747	8/5/2016	469.86	0.00	EADA BPANEAD
201602081124030689	3191229789540747	2/2/2016	279.80	0.00	EADA BPANEAD
201610190816380004	3191237987716442	10/14/2016	483.30	0.00	EADA BPANEAD
201512091414150356	3191229789540747	12/7/2015	999.74	0.00	EADA BPANEAD
201610181030320517	3191237987716442	10/3/2016	259.49	0.00	328OF DEPD

CPSS Transactions

TRANSACTION_GROUP..	PCARD_NBR	COMPANY_NM	COST	DOCUMENT_NBR	DOCUMENT_TITLE	DOCUMENT_CREATE...
201606211345260349	3191229789540747	C. G CDC PI...	1881.90	ED-16-PC-003...	ED-16-PC-0033...	201606030958300807

CARDHOLDER OVERVIEW PAGE

This page provides the percentages of how often, in terms of number of purchases and spending amount, a cardholder makes purchases (1) from a vendor, (2) from business under the same MCC, and (3) with whole dollar amount. The results from this page can be used to identify the usage patterns of a purchase card.



CARDHOLDER ACCOUNT ANALYSIS PAGE

Users can look up a cardholder or multiple cardholders for a fiscal year or multiple fiscal years to compare the number of transactions, the total billing amount, and spot high dollar transactions using the dot chart. Users can also export transactions for cardholders selected or transactions selected on the dot chart

Wildcard search: type * and the last, last 2, last 3, or last 4 digits of the account number. The more digits entered the more precise of the search results.

Dashboard
Dashboard Drill Down
Transaction
Cardholder Overview
Cardholder Account Analysis
Quick Reference Guide

Select All account or, enter specific account

- 3191229789540747
- 3191229789585777
- 3191229789638097
- 3191229789638147
- 3191229789640317
- 3191229789640357
- 3191229789645317

Select Financial Year

2012

2013

2014

2015

2016

2017

Total Transaction Per Account

Account Number	Active	LostOrStolen
3191229789638147	170	0
3191229789638097	130	0
3191229789585777	0	120
3191229789640317	70	0

Total Billing Amount Per Account

Account Number	Active	LostOrStolen
3191229789585777	0	\$170,000
3191229789638147	\$45,000	0
3191229789638097	\$5,000	0
3191229789640317	\$2,000	0

Individual Cardholder purchases

Total Number of records from the accounts selected 312

Purchase Details

"TRANSACTION_GROUP_ID"	"ACCT_NUM"	"BILLING_AM..."	"TAX_AMT"	"SUPP_NAME_NEW"	"SUPP_STATE"
201409261927030620	3191229789585777	495.00	0.00	ACTNALNATCONTR	VA
201409261927030620	3191229789585777	8500.00	0.00	INOVETHENMENT	DC
201501051332170040	3191229789585777	1077.00	0.00	BLES&NBARBLE	VA
201501280913170441	3191229789585777	902.36	0.00	CTS OFMETICE P	TN
201508061605510642	3191229789585777	3871.63	0.00	COMICEMYORODUC	TN
201410140957250463	3191229789585777	18.97	0.00	BLES&NBARBLE	NJ
201410281405070239	3191229789585777	163.11	0.00	ARDIONENVBUSIN	KS
201505201349080315	3191229789585777	983.50	0.00	INCR PRE COMP	NY
201512011550010264	3191229789585777	156.48	0.00	IN OFARGICE S	CA
201601261303550754	3191229789638097	4.59	0.00	ABCDEF	GA
201412041059480755	3191229789638097	5.03	0.00	ABCDEF	GA
201501061053100081	3191229789638097	9.47	0.00	ABCDEF	GA
201608291336130705	3191229789638097	13.77	0.00	ABCDEF	GA
201512021310120666	3191229789638097	4.44	0.00	ABCDEF	GA
201510061514550154	3191229789638097	5.03	0.00	ABCDEF	GA
201703161121240304	3191229789638097	4.70	0.00	ABCDEF	GA



School Summary System (Agile Analytics)

Project Backlog

Priority	User Stories...
#1	As a [Auditor] I want to [identify all Title IV Institutions with a high Cohort Default Rate (CDR) because the institution may have manipulated the loans in the CDR calculation to be eligible for Pell longer than otherwise possible.
#2	As a [Auditor] I want to [identify all Title IV Institutions with low First year retention rate because the institution may not be recruiting students appropriate for its programs.
#3	As a [Auditor] I want to [identify all Title IV Institutions with low Graduation rates because the institution may not be recruiting students appropriate for its programs.
#4	As a [Auditor] I want to [identify Proprietary Schools with high 90/10 Revenue Percentages because the Institution might not be applying the 90/10 calculation rules correctly.



Project Team Selection



CAATs Team Assessment

Identify Requirements



1-3 Week Sprint

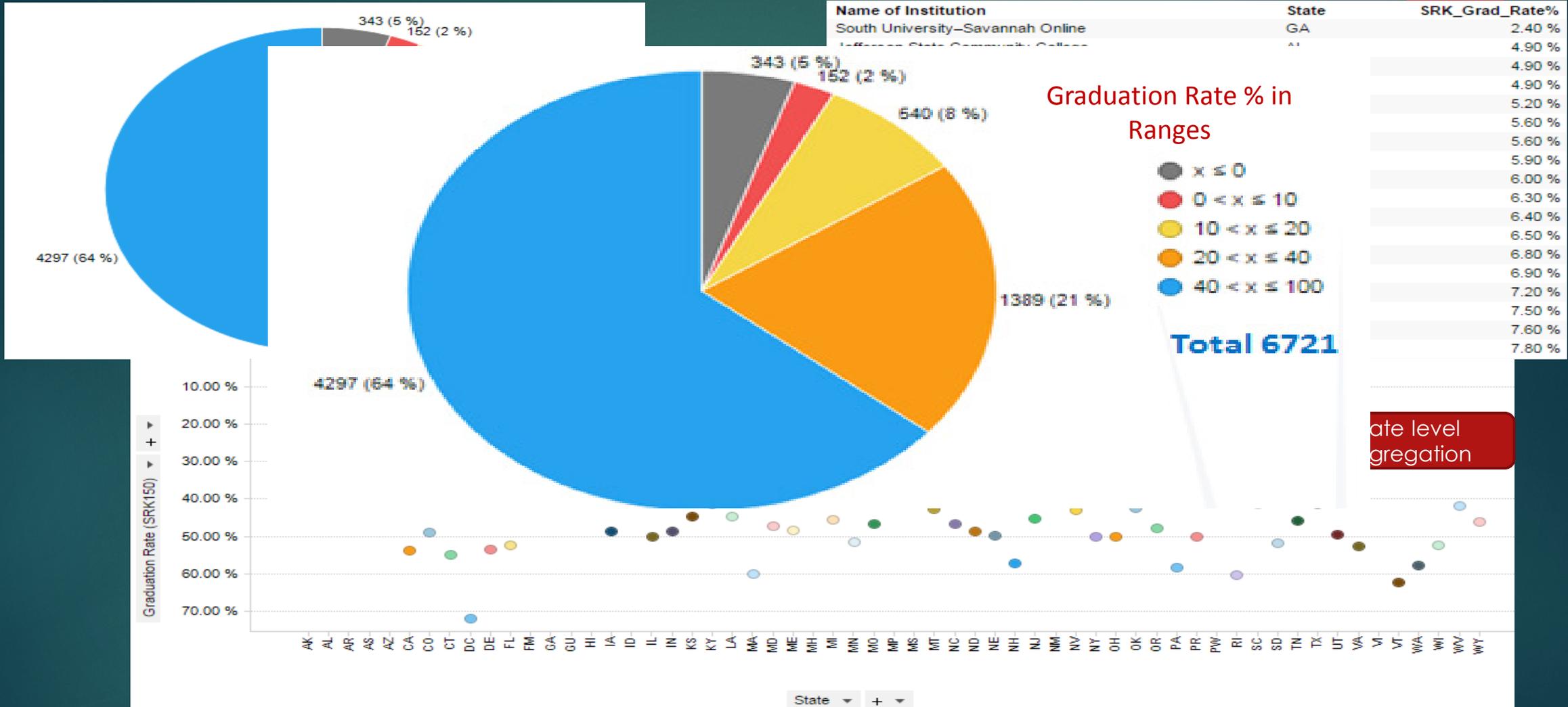
Development / Testing

ODAS Deliverable



Project Team Acceptance

User Story Case III: Low Graduation Rate (2013 ~14)



ate level
gregation





School Summary System	
Project Backlog	
Priority	User Stories...
#1	As a [Cyber Crime Investigator], I want to [find Internet Protocol (IP) addresses that are accessing or creating FSA-ID accounts on the PAS System] because we are identifying loan consolidators who are taking control over their student borrower accounts and violating the PAS terms and conditions.
#2	As a [Auditor] I want to [identify all Title IV Institutions with low First year retention rate because the institution may not be recruiting students appropriate for its programs.
#3	As a [Auditor] I want to [identify all Title IV Institutions with low Graduation rates because the institution may not be recruiting students appropriate for its programs.
#4	As a [Auditor] I want to [identify Proprietary Schools with high 90/10 Revenue Percentages because the Institution might not be applying the 90/10 calculation rules correctly.



CAATs Team Assessment

Identify Requirements



1-3 Week Sprint

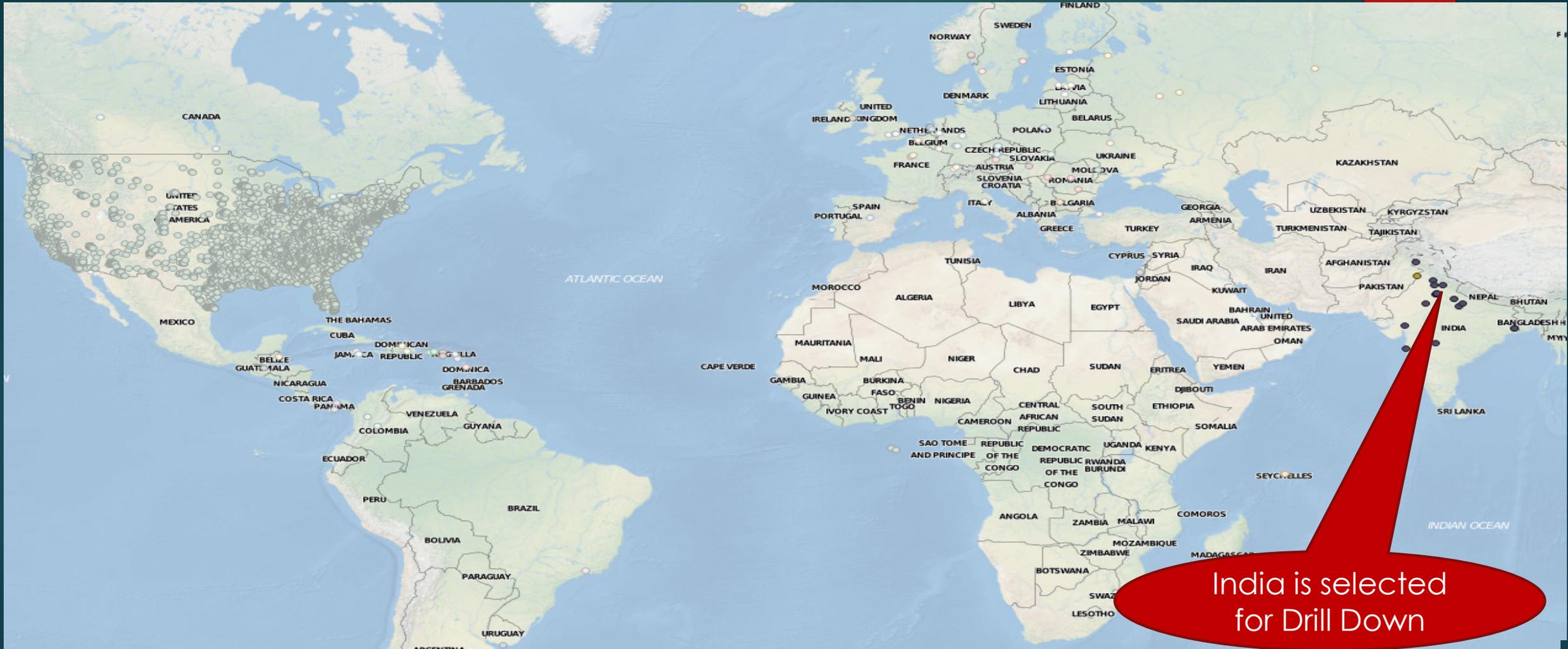
Development / Testing

ODAS Deliverable



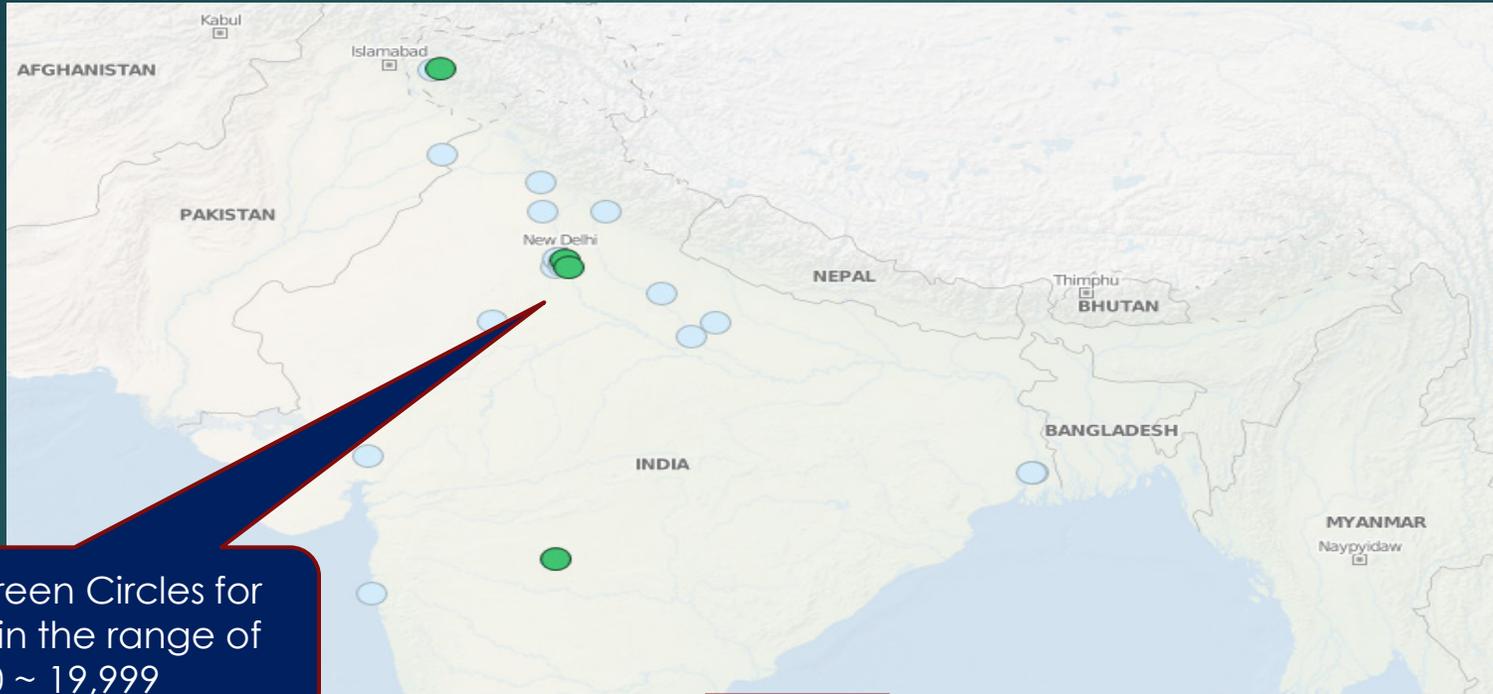
Project Team Acceptance

TCD – Shared PAS SSN Count All over the World (2015 to Current)



India is selected
for Drill Down

TCD - Drill Down - India



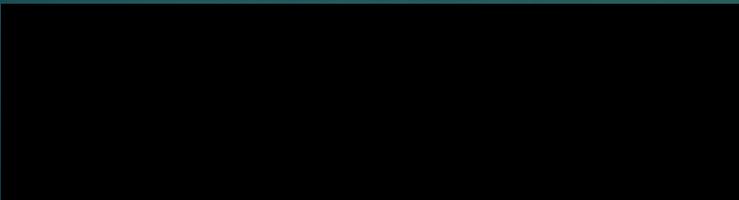
Shared PSS SSN Count Range

- 0 - 9999
- 10000 - 19999

Selected Green Circles for SSN Count in the range of 10,000 ~ 19,999



YEAR	IP	SHARED_PAS_SSN_COUNT	INTERNET_SERVICE_PROVIDER_NAME	COUNTRY_FUL...	CITY	LATITUDE	LONGITUDE
2015	64.147.5.98	10654	AS9498 BHARTI AIRTEL LTD.	INDIA	New Delhi	28.60	77.20
2015	12.150.205.194	10581	AS24560 BHARTI AIRTEL LTD., TELEMEDIA SERVICES	INDIA	Faridabad	28.43	77.32
2015	35.0.127.52	10292	AS9583 SIFY LIMITED	INDIA		20.00	77.00
2015	72.214.2.142	10126	AS17762 TATA TELESERVICES MAHARASHTRA LTD	INDIA		33.80	74.26



Questions?