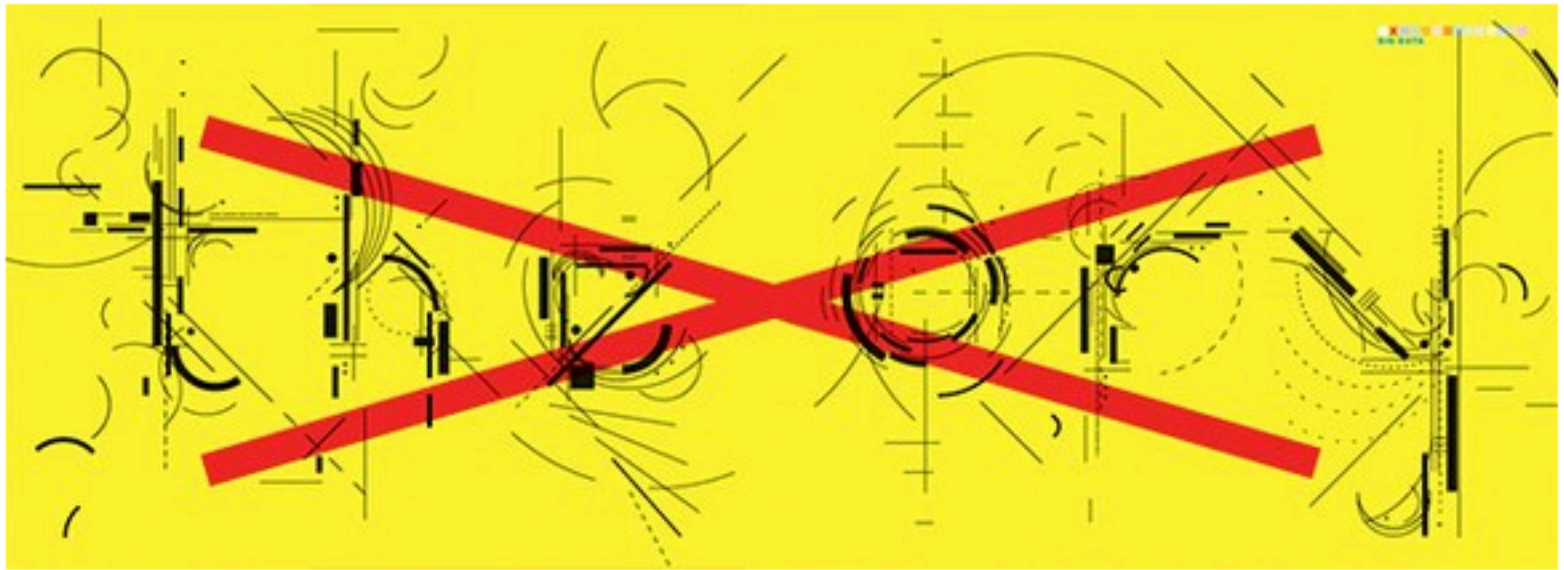
AI-Driven Claims Analytics
Machine Learning Meets Insurance Claims

AI *Driven Analytics*

CHRIS ANDERSON SCIENCE 06.23.08 12:00 PM

THE END OF THEORY: THE DATA DELUGE MAKES THE SCIENTIFIC METHOD OBSOLETE



Chris Anderson (canderson@wired.com) *is the editor in chief of* Wired.

SCOR
The Art & Science of Risk

HOW ARTIFICIAL INTELLIGENCE WILL IMPACT THE (RE)INSURANCE INDUSTRY

DENIS KESSLER
Chairman & CEO, SCOR

Denis Kessler, a French citizen, is a graduate of HEC business school (Ecole des Hautes Etudes Commerciales), holds a PhD in economics and advanced degrees in economics and social sciences, and is a Fellow of the French Institute of Actuaries.

He was Chairman of the Fédération Française des Sociétés d'Assurance (FFSA), Senior Executive Vice-President and member of the Executive Committee of the AXA Group and Executive Vice-President of MEDEF (Mouvement des Entreprises de France). He joined SCOR as Chairman and Chief Executive Officer on 4 November 2002. In January 2016, he was elected to join the Academy of Moral and Political Sciences of the Institut de France.

ARTIFICIAL INTELLIGENCE: A BURGEONING FIELD OF RESEARCH WHICH HAS TAKEN US INTO A NEW MACHINE AGE

John Hancock 'reinventing' life insurance to get people healthier, living longer: CEO

- CEO Marianne Harrison says John Hancock is "reinventing" the traditional life insurance model by only offering data-driven, interactive policies.
- The idea is to track fitness and health data through wearable devices and smartphones and reward policyholders for the steps they take.
- The company offers incentives to encourage people to live healthier, longer lives.

Michelle Fox | @MFoxCNBC

Published 3:54 PM ET Wed, 19 Sept 2018

CNBC

AIDA Team's Past Track Record

BANKING & FINANCE

AIA taps on A*Star's data analytics to study insurance consumers' needs

By Lee Meixian

MORE

'Engaging industry' a key priority in boosting S'pore as an R&D hub: NRF

AIA Group to up stake in Indian life insurance JV with Tata

SMRT partners A*Star to develop solutions to improve transport reliability

AIA Group on Tuesday said it has signed a multi-year joint collaboration agreement with A*Star's Institute for Infocomm Research (I2R), Singapore's largest information and communications tech research institute. ST PHOTO

MORE FROM THE BUSINESS TIMES

Expect currency wars in 2016, DBS chief warns

Temasek fund invests undisclosed sum in homegrown

Hot stocks: Keppel and Sembcorp Marine fall more

DBS mentioned as possible buyer in 3 potential sales

COMPUTERWORLD SINGAPORE

Standard Chartered partners A*STAR's I2R to leverage data to gain business insights Zafirah Salim | Jan. 25, 2016

10 top news

thesundaytimes April 14, 2013

S'pore team tops in predicting flight timings

It beats 170 teams with solution that could help airlines save millions of dollars

Grace Chng
Senior Correspondent

Travellers often have to put up with long flight delays and even cancellations. Flights can leave late but arrive early. It is a puzzle that has frustrated airlines and travellers alike.

American conglomerate General Electric decided to find a solution. It launched the GE Flight Quest, with a prize of US$100,000 (S$124,000) to anyone who could develop a solution that lets airlines better predict flight arrival times and reduce frustrations about

(From left) Advyter Li Xiao Li and team members Mr Conort, Dr Cao, Dr Phua and Dr Yap. The fifth member, who is not in the picture, is Dr Chua.

SCIENCE HOME

ons

App tells you if place is hot spot or dead town

Software identifies crooked sellers faster

Built by Visa and A*Star, i

Fighting crime through data mining

Institute for Infocomm Research works with leading credit card company to detect fraud using advanced data analytics technology. OO GIN LEE reports

A Singapore research institute is helping a credit card company weed out fraudulent online merchants.

The three-year collaboration started in October last year between the Institute for Infocomm Research (I2R) and the local office of the credit card company. The company cannot be named because of a commercial confidentiality agreement.

Data analytics scientists at the institute studied data from millions of credit card purchases involving thousands of online merchants and devised a scientific methodology to distinguish bona fide online vendors from Internet fraudsters.

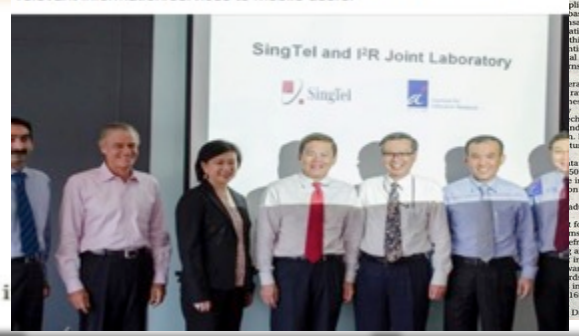
The company already knew which merchants were crooks but did not tell the institute. The customers and their purchases were not identified.

Dr Shonali Krishnaswamy (left), acting head of the institute's Data Analytics Department, said the scientists nailed

PHOTOS: ST FILE: ASTAR

Researchers at I2R are able to take raw data and apply sophisticated algorithms to

I2R has announced its partnership with SingTel to set up a joint laboratory to develop advanced data analytics for innovative, personalised and relevant information/services to mobile users.



thesundaytimes

THE STRAITS TIMES asiareport

kaggle

InformationWeek
THE BUSINESS VALUE OF TECHNOLOGY

GIGAOM

GE Report

Forbes

MIT Technology Review

AIDA's AI *Driven SMART-CLAIMS* Portfolio

Augmented Intelligence for Claims Management

STP for Improving Processes

Machine Learning for Information Extraction & Predictive Claims Processing

Fraud Detection using Outlier Algorithms

Outlier Detection and Drift Detection for suspicious claims

AI/ML driven Underwritting Algorithm

Predicting Propensity to Claim

AIDA SMART-CLAIMS:
Insurance Claims Straight Through Processing (STP)

AI *Driven Analytics*

AIDA SMART-CLAIMS System

AIDA Intelligent Info Extraction Engine

CLAIM RECORDS

Extracted Line Items and Link to Claim

Claim Records + Line Items

Client Info, Policy, Hospital, ICD Code, Bill Amount, Policy Exclusions, Claim Notes, Surgical Codes

Extended Claims Record with Payable Line Items

AIDA Machine Learning Engine

AIDA ICD Code Mining Engine

Basic Decision Model
- ✓ Accept
- ✓ Decline
- ✓ Partial Pay

Extended Decision Model
(Semantically Linked ICD Codes and Exclusions)
- ✓ Net Amount
- ✓ Payable Items
- ✓ Explanation for Decline Reasons

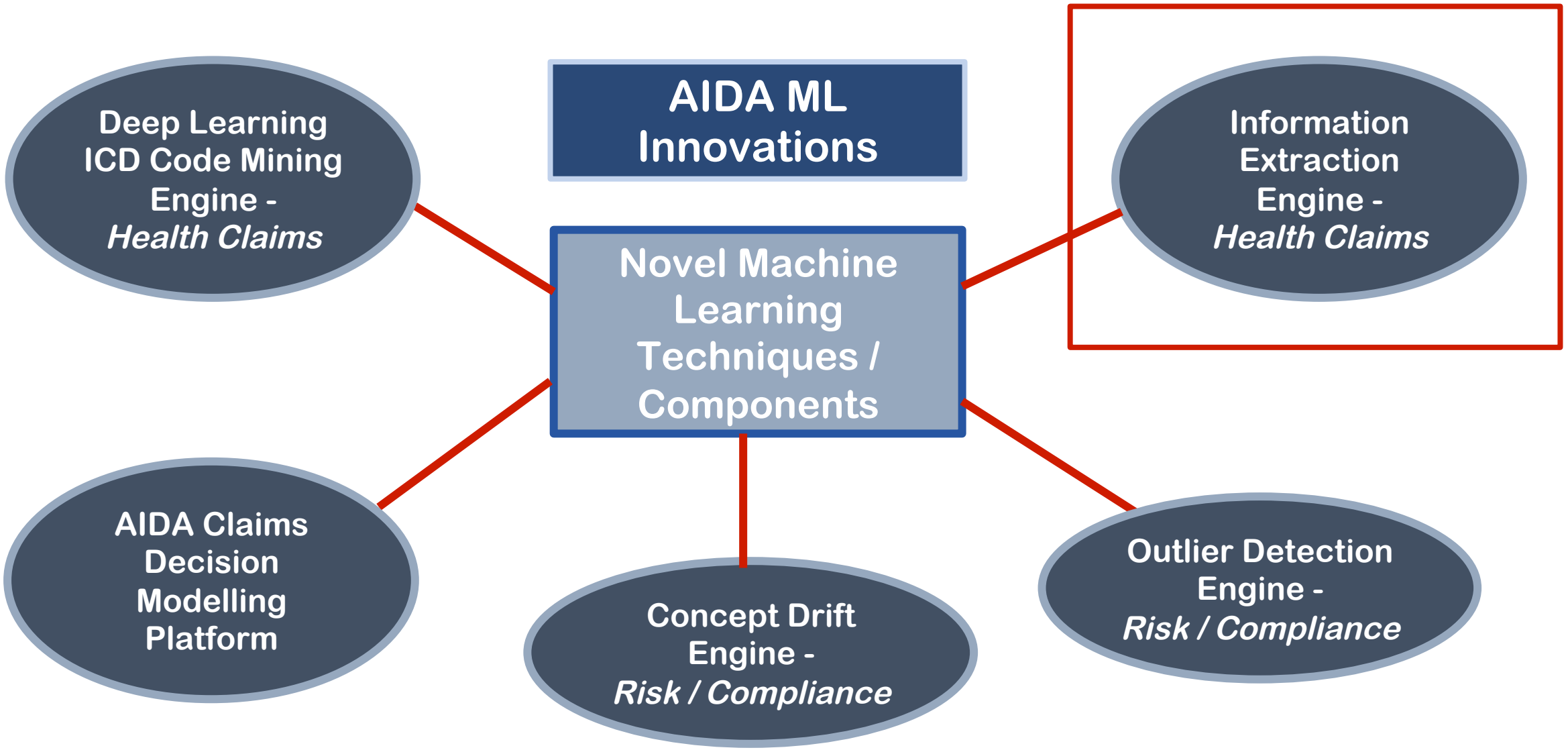
Claims Worksheet for Assessor Review

AIDA Outlier Engine

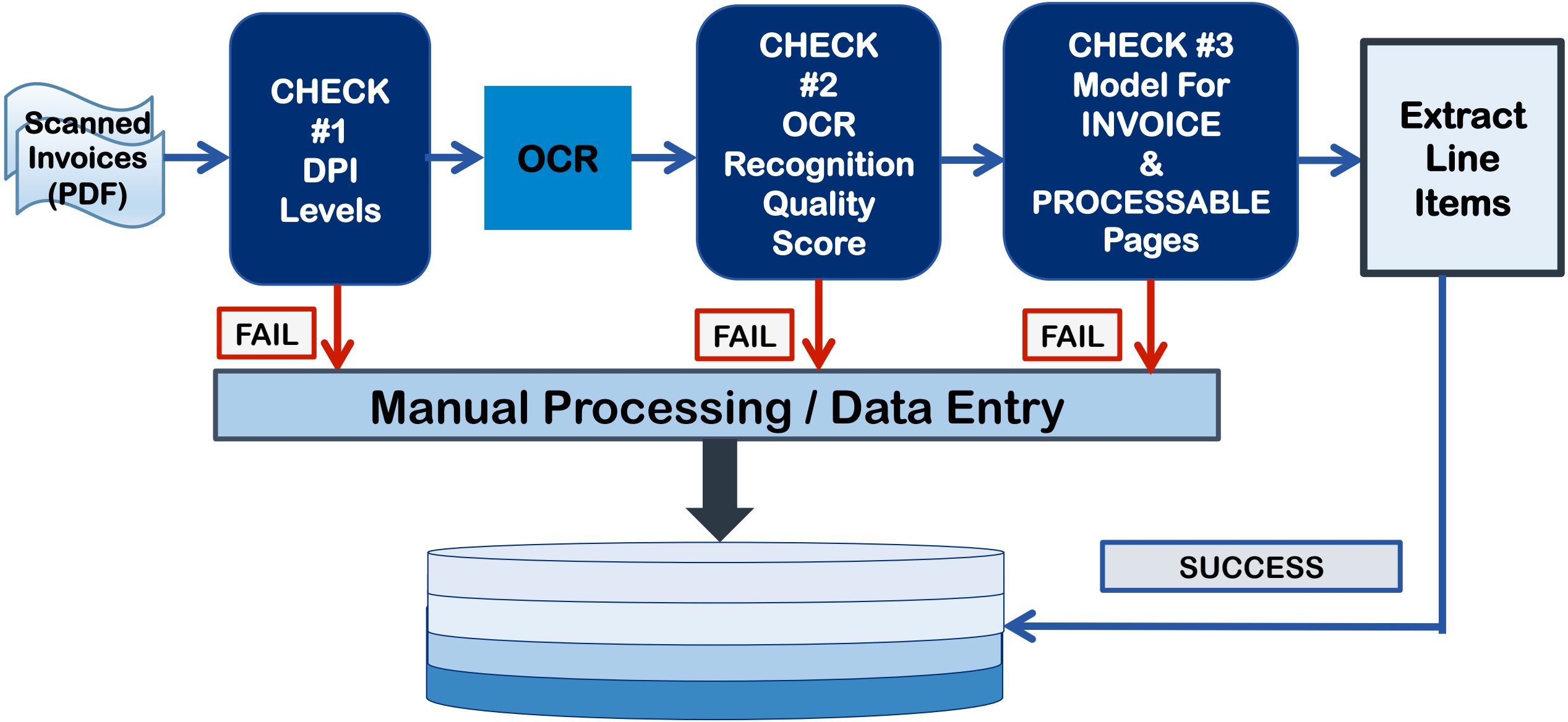
Claims Data

Unusual, Potentially Suspicious Claims

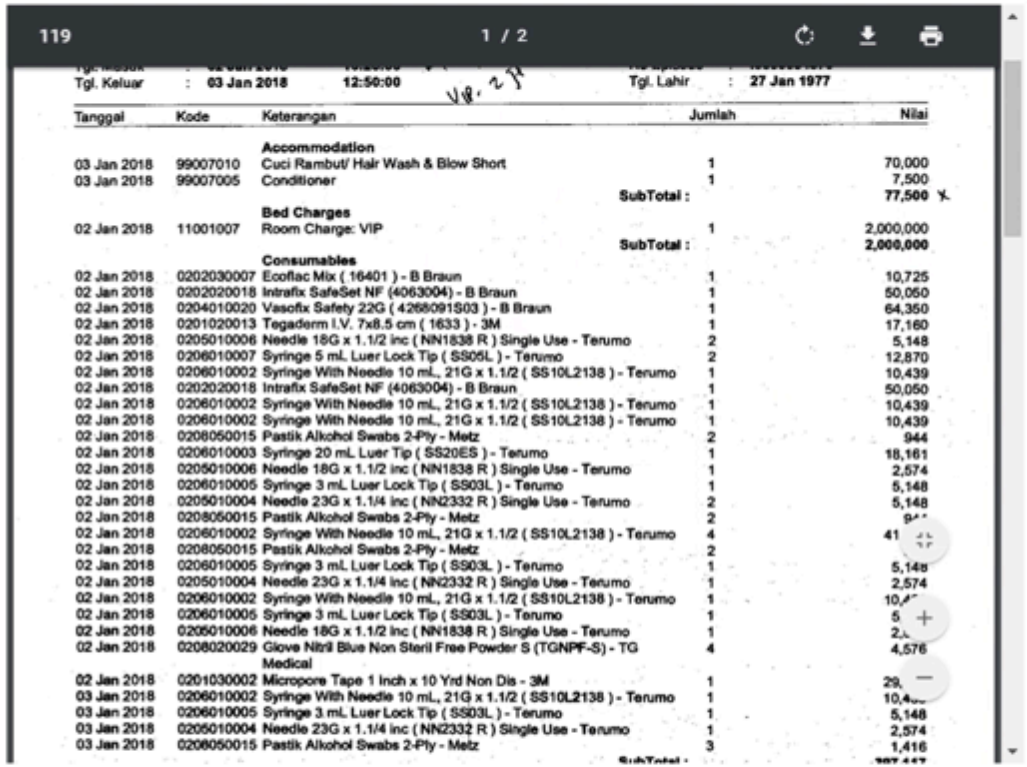
AIDA – Machine Learning Innovations



AIDA Intelligent Information Extraction



Invoice 119


119 1 / 2

Tgl. Keluar : 03 Jan 2018 12:50:00 Tgl. Lahir : 27 Jan 1977

Tanggal	Kode	Keterangan	Jumlah	Nilai
		Accommodation		
03 Jan 2018	99007010	Cuci Rambut/ Hair Wash & Blow Short	1	70,000
03 Jan 2018	99007005	Conditioner	1	7,500
		SubTotal :		**77,500**
		Bed Charges		
02 Jan 2018	11001007	Room Charge: VIP	1	2,000,000
		SubTotal :		**2,000,000**
		Consumables		
02 Jan 2018	0202030007	Ecoflac Mix (16401) - B Braun	1	10,725
02 Jan 2018	0202020018	Intrafix SafeSet NF (4063004) - B Braun	1	50,050
02 Jan 2018	0204010020	Vasofix Safety 22G (4268091S03) - B Braun	1	64,350
02 Jan 2018	0201020013	Tegaderm I.V. 7x8.5 cm (1633) - 3M	1	17,160
02 Jan 2018	0205010006	Needle 18G x 1.1/2 inc (NN1838 R) Single Use - Terumo	2	5,148
02 Jan 2018	0206010007	Syringe 5 mL Luer Lock Tip (SS05L) - Terumo	2	12,870
02 Jan 2018	0206010002	Syringe With Needle 10 mL, 21G x 1.1/2 (SS10L2138) - Terumo	1	10,439
02 Jan 2018	0202020018	Intrafix SafeSet NF (4063004) - B Braun	1	50,050
02 Jan 2018	0206010002	Syringe With Needle 10 mL, 21G x 1.1/2 (SS10L2138) - Terumo	1	10,439
02 Jan 2018	0206010002	Syringe With Needle 10 mL, 21G x 1.1/2 (SS10L2138) - Terumo	1	10,439
02 Jan 2018	0208050015	Pastik Alkohol Swabs 2-Ply - Metz	2	944
02 Jan 2018	0206010003	Syringe 20 mL Luer Tip (SS20ES) - Terumo	1	18,161
02 Jan 2018	0205010006	Needle 18G x 1.1/2 inc (NN1838 R) Single Use - Terumo	1	2,574
02 Jan 2018	0206010005	Syringe 3 mL Luer Lock Tip (SS03L) - Terumo	1	5,148
02 Jan 2018	0205010004	Needle 23G x 1.1/4 inc (NN2332 R) Single Use - Terumo	2	5,148
02 Jan 2018	0208050015	Pastik Alkohol Swabs 2-Ply - Metz	2	944
02 Jan 2018	0206010002	Syringe With Needle 10 mL, 21G x 1.1/2 (SS10L2138) - Terumo	4	41
02 Jan 2018	0208050015	Pastik Alkohol Swabs 2-Ply - Metz	2	
02 Jan 2018	0206010005	Syringe 3 mL Luer Lock Tip (SS03L) - Terumo	1	5,148
02 Jan 2018	0205010004	Needle 23G x 1.1/4 inc (NN2332 R) Single Use - Terumo	1	2,574
02 Jan 2018	0206010002	Syringe With Needle 10 mL, 21G x 1.1/2 (SS10L2138) - Terumo	1	10,4
02 Jan 2018	0206010005	Syringe 3 mL Luer Lock Tip (SS03L) - Terumo	1	5
02 Jan 2018	0205010006	Needle 18G x 1.1/2 inc (NN1838 R) Single Use - Terumo	1	2,5
02 Jan 2018	0208020029	Glove Nitril Blue Non Steril Free Powder S (TGNPF-S) - TG Medical	4	4,576
02 Jan 2018	0201030002	Micropore Tape 1 Inch x 10 Yrd Non Dis - 3M	1	29,
03 Jan 2018	0206010002	Syringe With Needle 10 mL, 21G x 1.1/2 (SS10L2138) - Terumo	1	10,4
03 Jan 2018	0206010005	Syringe 3 mL Luer Lock Tip (SS03L) - Terumo	1	5,148
03 Jan 2018	0205010004	Needle 23G x 1.1/4 inc (NN2332 R) Single Use - Terumo	1	2,574
03 Jan 2018	0208050015	Pastik Alkohol Swabs 2-Ply - Metz	3	1,416

	Invoice ID	Page No	Description	Price	Quantity	Amount	Change Type
−	119	1	Cud Rambut/ Hair Wash & Blow Short			70000	Others
−	119	1	Conditioner			7500	Others
−	119	1	Room Charge: VIP		1	2000000	Others
−	119	1	Ecoflac Mix (16401) - B Braun		1	10725	Others
−	119	1	Intrafix SafeSet NF (4063004) - B Braun		1	50050	Others
−	119	1	Vasofix Safety 22G (4268091S03) - B Braun		1	64350	Others
−	119	1	Tegaderm I.V. 7x8.5 cm (1633) 3M		1	17160	Others
+	119						Others

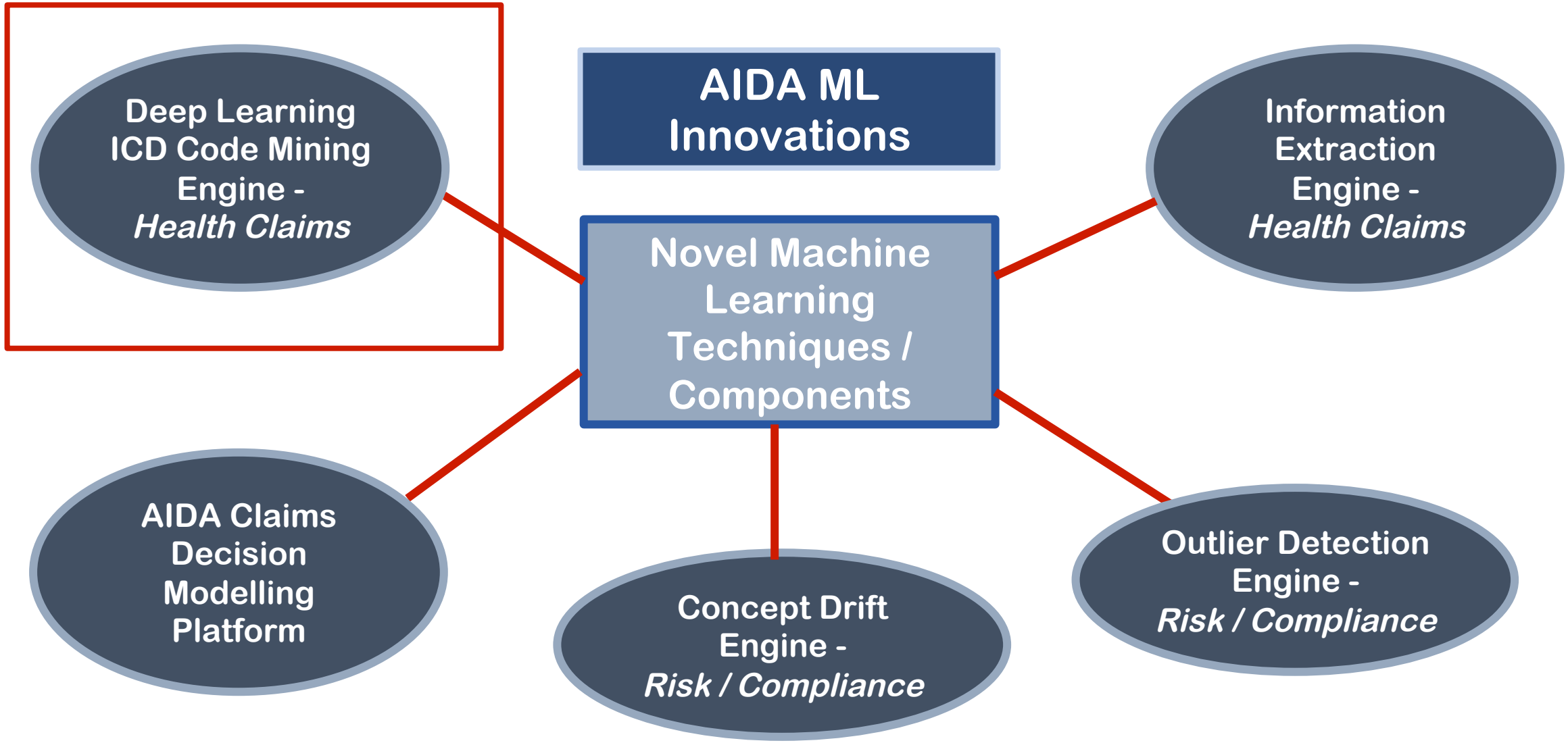
Discard Changes Save Changes

− 110 1 Tegaderm I.V. 7x8.5 cm (1633) 3M 1 17160 Others

+ 108 3 Others

Discard Changes Save Changes

AIDA – Machine Learning Innovations



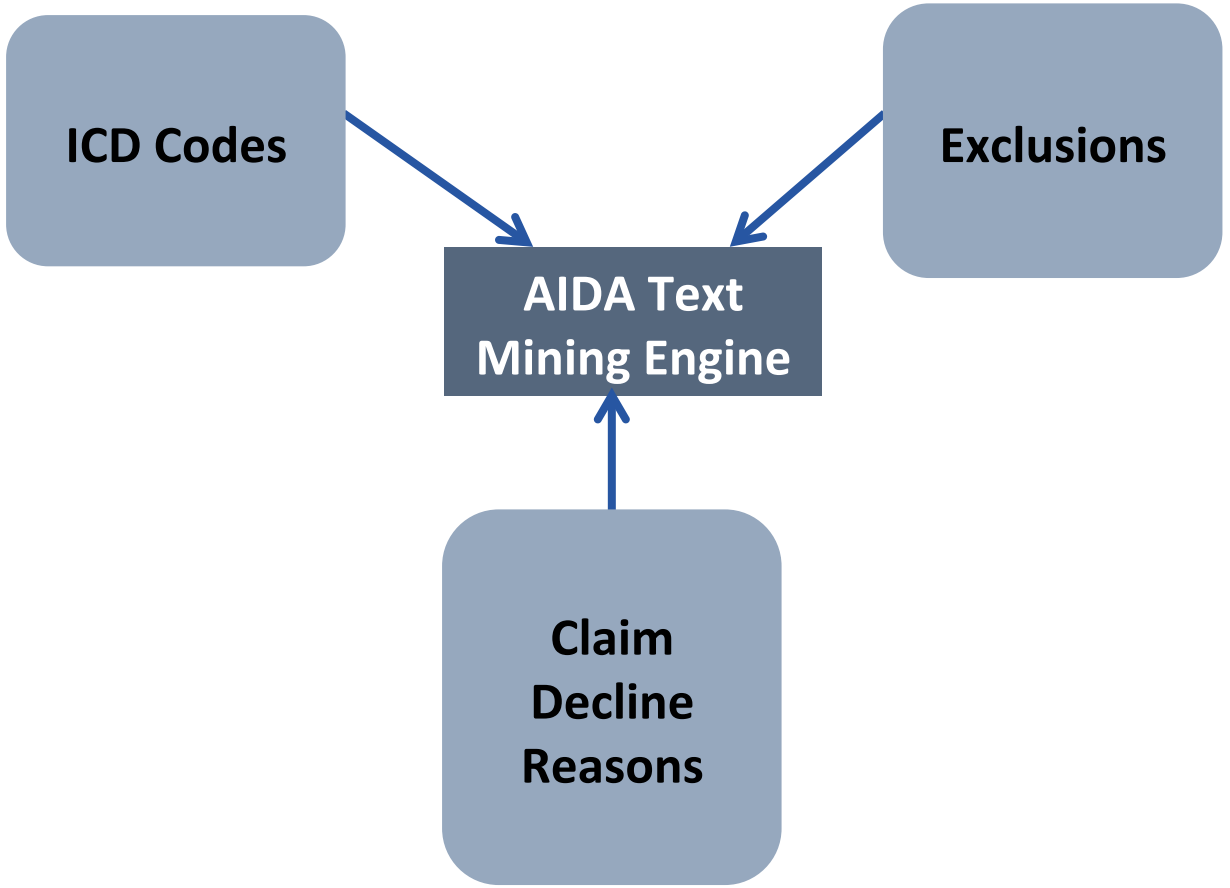
Deep Learning and Text Mining to Learn Contextual Connections

Key Challenge

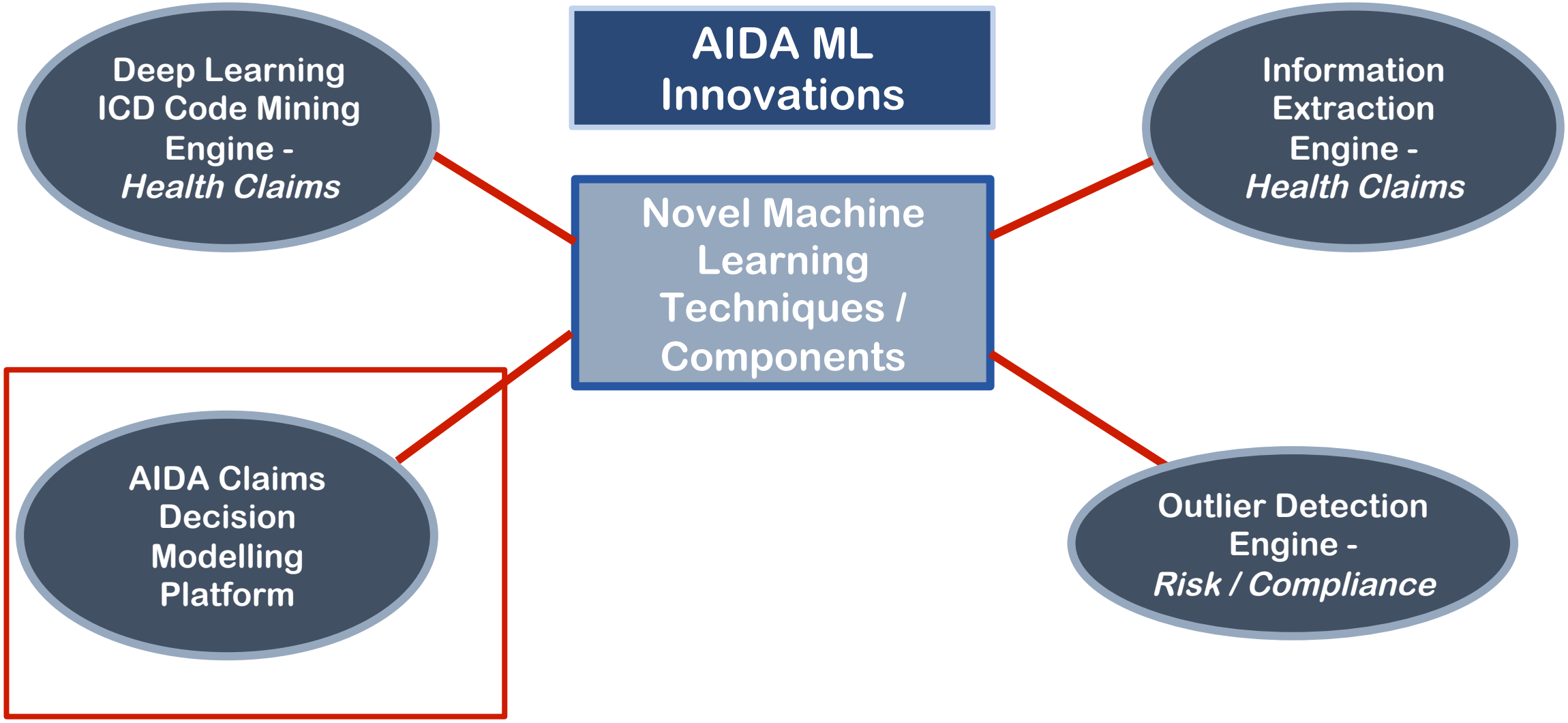
- ❑ ICD Codes and Exclusions are Not Semantically Linked
- ❑ ICD Codes are in Medical Terms (e.g. Obstetrics)
- ❑ Exclusions are in Layman's Terms (e.g. Maternity)

AIDA AI-CLAIMS Text Mining Engine Automatically Learns Contextual Connections from Text Data

- ➢ Connect Terms to ICD Codes
- ➢ Connect Terms to Exclusions
- ➢ Connect ICD Codes to Related ICD Codes
- ➢ Connect Exclusion Codes to ICD Codes



AIDA – Machine Learning Innovations



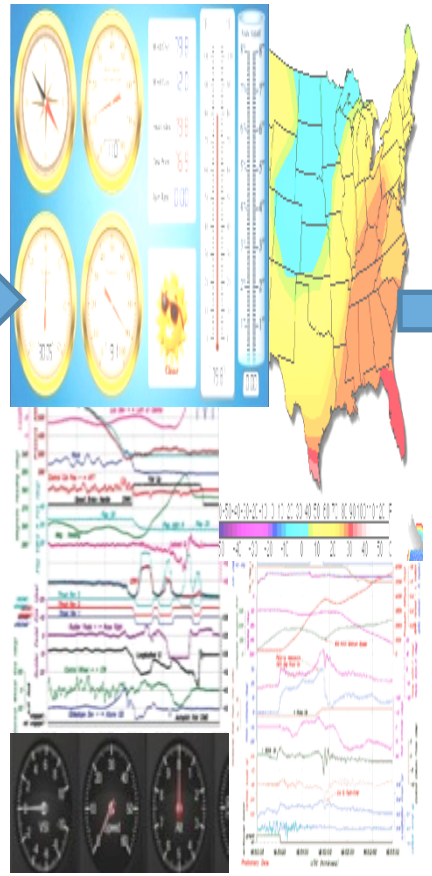
AISA SMART-CLAIMS Claims Decision Engine

Claims Data

Predicted Variables

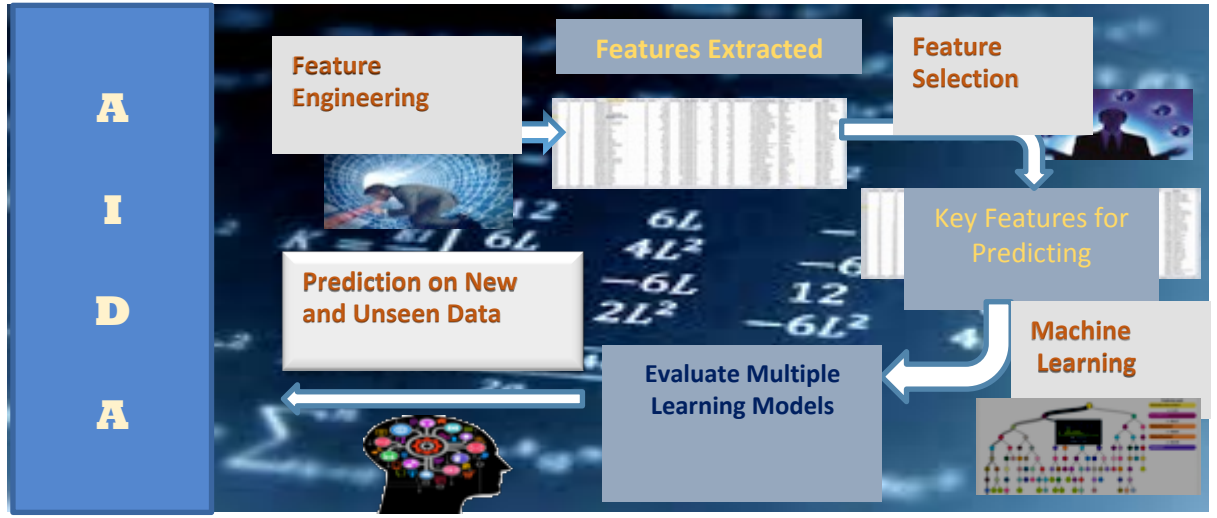
1) Claims Approve / Decline
2) Partial / Full
3) Payable Line Items
4) Claims Amount
5) Decline Reasons

Heterogeneous Data Sources



Data Preparation

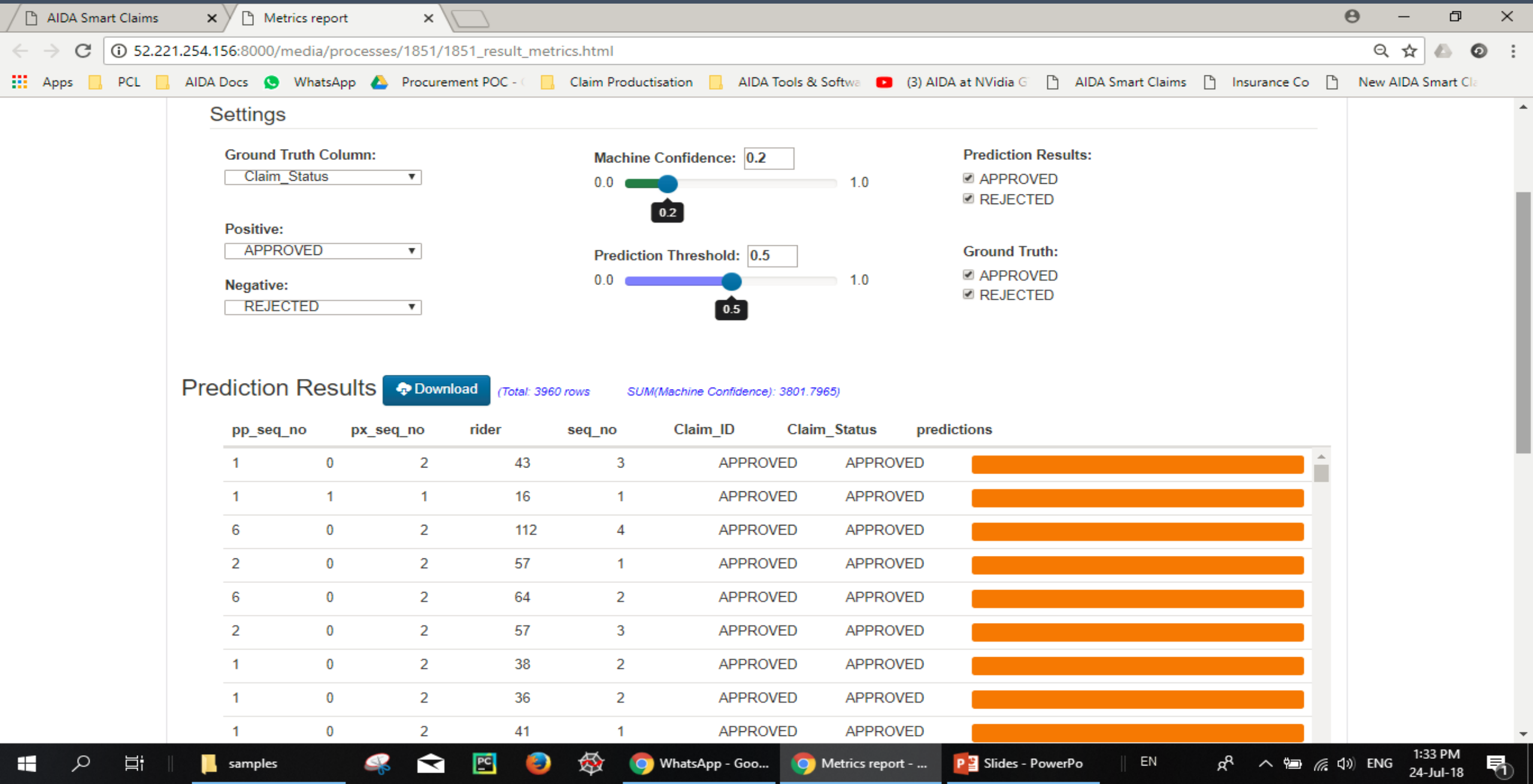
AIDA Multi-Modal Prediction Engine



Validation and Testing

Claims Data WITHOUT the Decision → AIDA Predictive Model → Predicted *Decision* → Model Accuracy –Based on ACTUAL Decision

Model Results



STP Calculator

AIDA Smart Claims | Metrics report

52.221.254.156:8000/media/processes/2768/7de710fda12252556ec8b75dfe9f69a4_result_metrics.html

Summary Report | Prediction Results | Model Performance | Straight Through Processing | Prediction Reports

Straight Through Processing

STP Settings

Apply Settings

Decision:

☑ APPROVED
☑ REJECTED

Machine Confidence '>': 0.8

0.0 — 0.8 — 1.0

Claim Amount '<': 300

STP Results

STP Rate: 30.76 %

Accuracy: 98.44 %

Cost $: 2351.49

Total amount of the false positive case

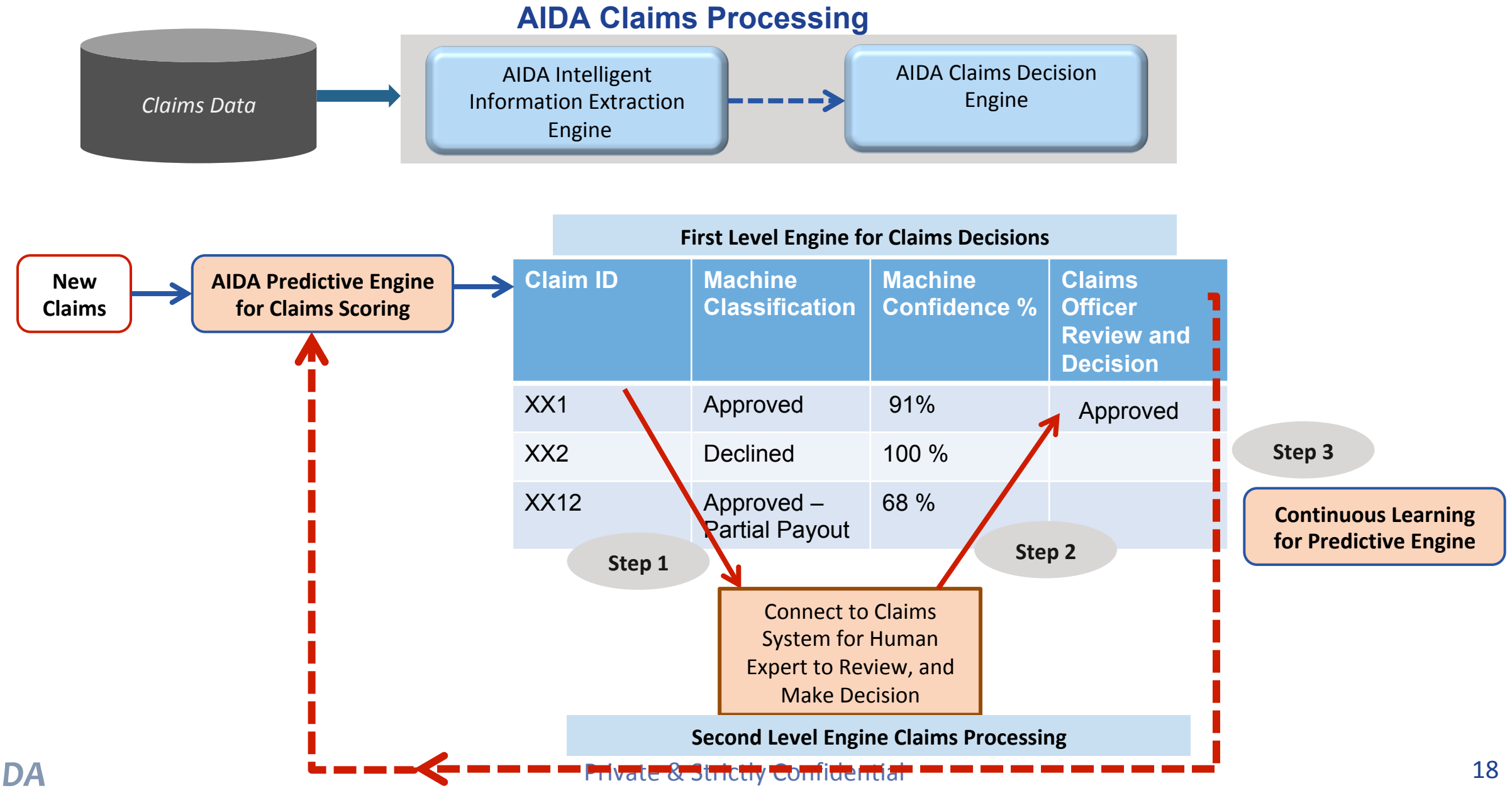
* **Total number of claims:** 3950
* **Number of claims after STP:** 1215
* **Number of claims with correct prediction:** 1196

Prediction Results

Download

pp_seq_no	px_seq_no	rider	Claim_ID	payment	Total_Bill_Amount	Ground_Truth	Prediction_Result	Approved_Probability	Rejected_Probability
1	1	1	1	49.38	49.38	APPROVED	APPROVED	0.99931	0.00069
1	0	2	3	222.03	222.03	APPROVED	APPROVED	0.99928	0.00072
2	1	1	2	21.83	21.83	APPROVED	APPROVED	0.99923	0.00077
2	1	1	18	17.34	17.34	APPROVED	APPROVED	0.99917	0.00083
2	1	1	19	233.42	233.42	APPROVED	APPROVED	0.99916	0.00084

AIDA SMART-CLAIMS (Continuous Learning & Update)



Prudential/AIDA @ Singapore Fintech Festival 2017

PRUDENTIAL Always Listening. Always Understanding.

Our Solutions — Solutions to meet your needs
Our Services — Policyholder Privileges
Our Company — Learn about Prudential
Our People — Think Positive, Act Decisive.

HOME > Our Company > Press

« 2017

Insurance claims assessment in seconds soon a reality for Prudential Singapore PRUshield policyholders

Insurer trialing an intelligent machine learning-based solution that simplifies claims assessment

SINGAPORE, 13 November 2017 – Prudential Singapore (Prudential) is leading a step change in the way insurance claims are made with its trial of an industry-first, machine learning-based solution that assesses claims in seconds.

“ we passed some data to the AIDA team to analyse, … we didn’t tell them anything about the data but they made sense out of it.
It made us realise we are sitting on a goldmine of data ...,”

AIDA's AI *Driven SMART-CLAIMS* Portfolio

Augmented Intelligence for Claims Management

STP for Improving Processes

Machine Learning for Information Extraction & Predictive Claims Processing

AI/ML driven Underwritting Algorithm

Predicting Propensity to Claim

Fraud Detection using Outlier Algorithms

Outlier Detection and Drift Detection for suspicious claims

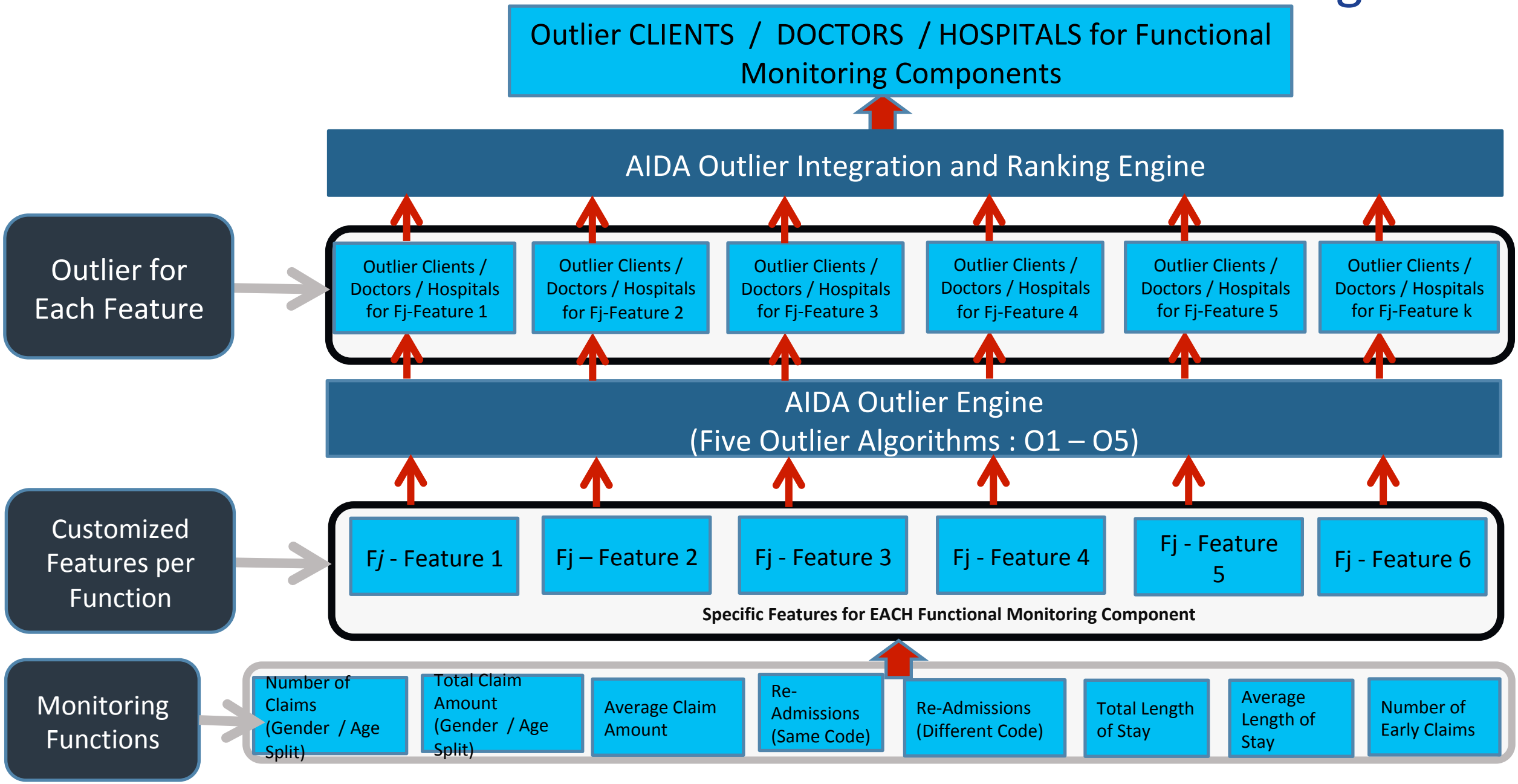
Outlier Analysis for Health Claims

Key Risk Indicators:

- ✓ Average and Total Number of Claims (Gender / Age / Race)
- ✓ Average and Total Claim Amount
- ✓ Number of Surgeries
- ✓ Average and Total Surgical Fee
- ✓ Unusual Surgeries (specific to ICD Code / Diagnosis)
- ✓ Re-Admission Patterns
- ✓ Length of Stay
- ✓ Number of Scans / Procedures
- ✓ Average and Total Procedure Fee
- ✓ Early Claims (with respect to policy inception date)
- ✓ Unusual Early Claims (specific to ICD Code / Diagnosis)
- ✓ Unusual Procedures (specific to ICD Code / Diagnosis)

Customisable and Configurable

AIDA Outlier Detection and Claims Risk Scoring



CLIENTS OUTLIERS

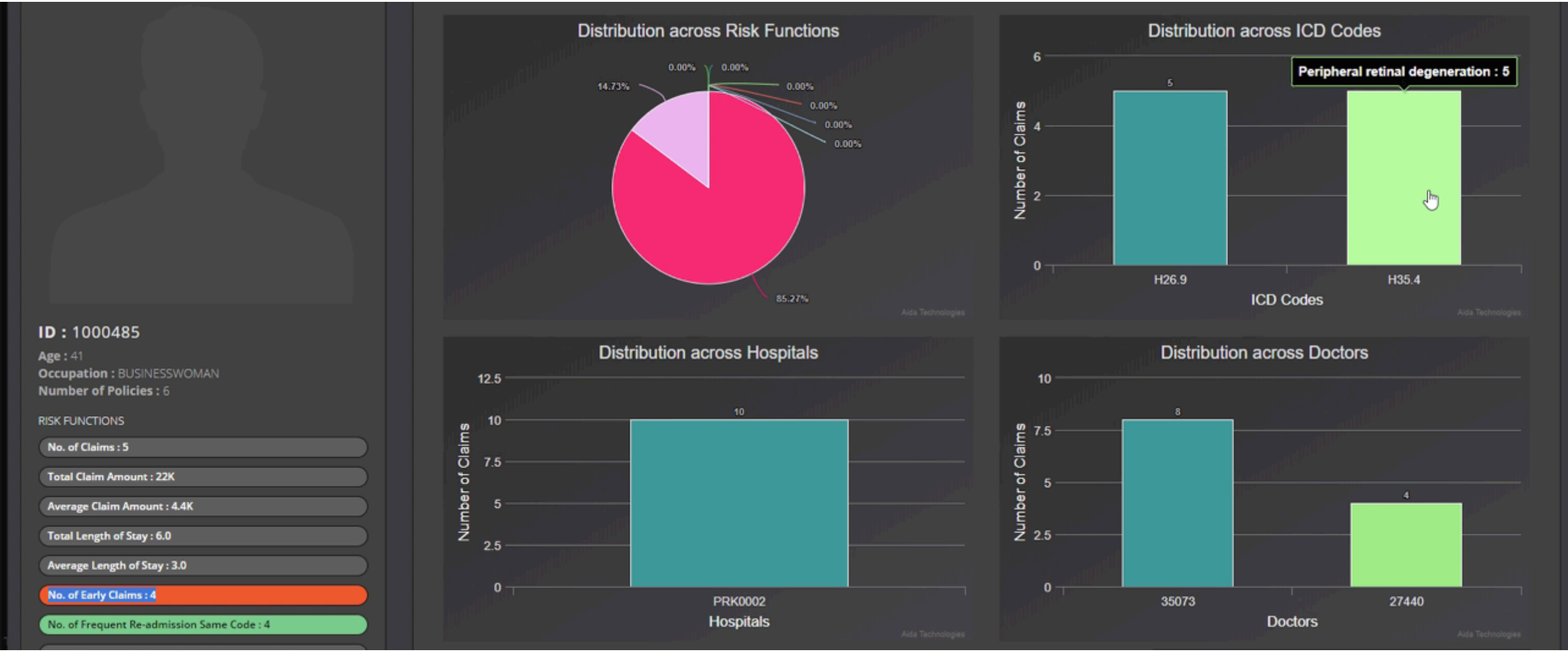
Top 10 ICD Codes Based on Claim Amount
All : All Top 10 ICD Codes
Grouping By: By ICD-Code

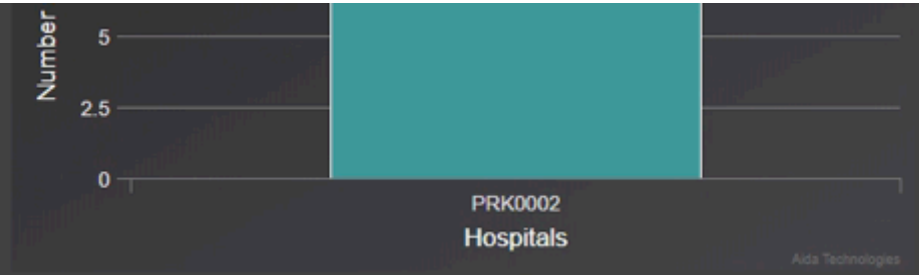
Outlier Feature
○ All ICD Codes ○ Top 10 ICD Codes Based on No. Of Claims ◉ Top 10 ICD Codes Based on Claim Amount ○ Top 10 ICD Codes Based on Avg Claim Amount

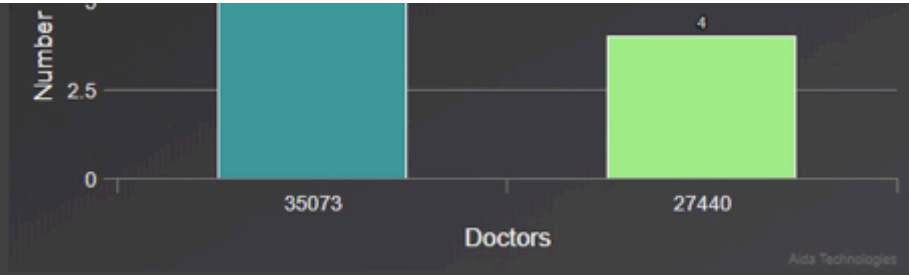
Segmentation
○ All Segments ○ By Gender-Age Band ◉ By ICD-Code ○ By Gender-Age-ICD

ICD Code
◉ All ○ K29.7 ○ A09.9 ○ H26.9 ○ A90.X ○ C50.9 ○ R50.9 ○ J40.X ○ R50.8 ○ J18.9 ○ E14.9

Clients	NUMBER OF CLAIMS	TOTAL CLAIM AMOUNT	AVERAGE CLAIM AMOUNT	TOTAL LENGTH OF STAY	AVERAGE LENGTH OF STAY	NUMBER OF EARLY CLAIMS	NUMBER OF FREQUENT RE-ADMISSION SAME CODE	NUMBER OF FREQUENT RE-ADMISSIONS DIFFERENT CODE
1368435	1.00	1.00	0.00	0.00	0.00	0.00	1.00	0.28
1480658	0.63	0.19	0.00	0.00	0.00	0.00	1.00	0.97
1495638	1.00	0.11	0.00	0.00	0.00	0.00	1.00	0.42
1229317	0.62	0.51	0.00	0.00	0.00	0.10	0.90	0.36
511	0.53	0.00	0.00	0.00	0.00	0.00	0.92	1.00
849146	0.63	0.17	0.00	0.00	0.00	0.00	1.00	0.57
933756	1.00	0.04	0.00	0.02	0.00	0.00	0.60	0.70
1175713	1.00	0.05	0.00	0.00	0.00	0.00	0.95	0.29
796476	0.24	0.00	0.00	0.00	0.00	0.00	1.00	1.00
997188	0.21	0.00	0.00	1.00	1.00	0.00	0.00	0.00


ID : 1000485
Age : 41
Occupation : BUSINESSWOMAN
Number of Policies : 6
RISK FUNCTIONS
No. of Claims : 5
Total Claim Amount : 22K
Average Claim Amount : 4.4K
Total Length of Stay : 6.0
Average Length of Stay : 3.0
No. of Early Claims : 4
No. of Frequent Re-admission Same Code : 4
Distribution across Risk Functions
0.00%
0.00%
14.73%
0.00%
0.00%
0.00%
0.00%
85.27%
Distribution across ICD Codes
Peripheral retinal degeneration : 5
Number of Claims
6
4
2
0
5
H26.9
H35.4
ICD Codes
Distribution across Hospitals
12.5
10
7.5
5
2.5
0
Number of Claims
10
PRK0002
Hospitals
Distribution across Doctors
10
7.5
5
2.5
0
Number of Claims
8
4
35073
27440
Doctors





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- Total Length of Stay : 6.0
- Average Length of Stay : 3.0
- No. of Early Claims : 4
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Hide Claim History

Claim ID	Claim Date	Claim Amount	ICD Code	Hospital Code	Doctor Code	Policy Inception Date	Admission Date	Discharge Date	No of days since Inception	Length of Stay
16142097	2016-04-11	20475.95	H26.9	PRK0002	27440	2013-10-01	2016-04-13	2016-04-15	925	2
16142097	2016-04-11	20475.95	H26.9	PRK0002	35073	2013-10-01	2016-04-13	2016-04-15	925	2
16142097	2016-04-11	20475.95	H26.9	PRK0002	27440	2014-02-01	2016-04-13	2016-04-15	802	2
16142097	2016-04-11	20475.95	H26.9	PRK0002	35073	2014-02-01	2016-04-13	2016-04-15	802	2
16142097	2016-04-11	20475.95	H26.9	PRK0002	27440	2014-04-01	2016-04-13	2016-04-15	743	2
16142097	2016-04-11	20475.95	H26.9	PRK0002	35073	2014-04-01	2016-04-13	2016-04-15	743	2
16142097	2016-04-11	20475.95	H26.9	PRK0002	27440	2014-06-01	2016-04-13	2016-04-15	682	2
16142097	2016-04-11	20475.95	H26.9	PRK0002	35073	2014-06-01	2016-04-13	2016-04-15	682	2
16142097	2016-04-11	20475.95	H26.9	PRK0002	27440	2015-02-01	2016-04-13	2016-04-15	437	2

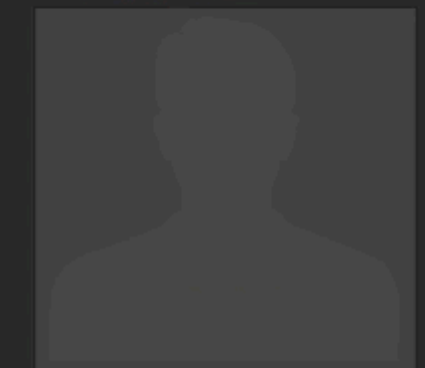
CLIENTS OUTLIERS

All ICD Codes

Grouping By: All Segments

Outlier Feature

(•) All ICD Codes ( ) Top 10 ICD Codes Based on No. Of Claims ( ) Top 10 ICD Codes Based on Claim Amount ( ) Top 10 ICD Codes Based on Avg Claim Amount



ID : 1368435

Age : 4
Occupation : CHILD
Number of Policies : 1

RISK FUNCTIONS

- No. of Claims : 59
- Total Claim Amount : 120K
- Average Claim Amount : 2K
- Total Length of Stay : 116.0
- Average Length of Stay : 2.0714285...
- No. of Early Claims : 0
- No. of Frequent Re-admission Sam...

ID : 1480658

Age : 33
Occupation : DRIVER
Number of Policies : 2

RISK FUNCTIONS

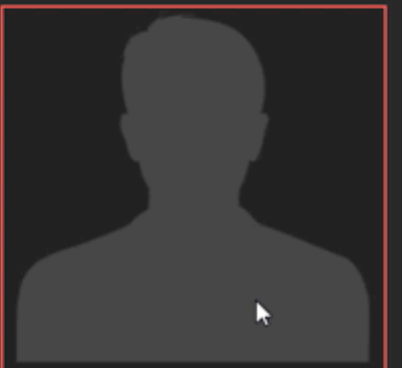
- No. of Claims : 29
- Total Claim Amount : 285K
- Average Claim Amount : 9.8K
- Total Length of Stay : 134.0
- Average Length of Stay : 5.8260869...
- No. of Early Claims : 0
- No. of Frequent Re-admission Sam...

ID : 1495638

Age : 26
Occupation : COURIER
Number of Policies : 1

RISK FUNCTIONS

- No. of Claims : 60
- Total Claim Amount : 122K
- Average Claim Amount : 2K
- Total Length of Stay : 22.0
- Average Length of Stay : 2.75
- No. of Early Claims : 0
- No. of Frequent Re-admission Sam...

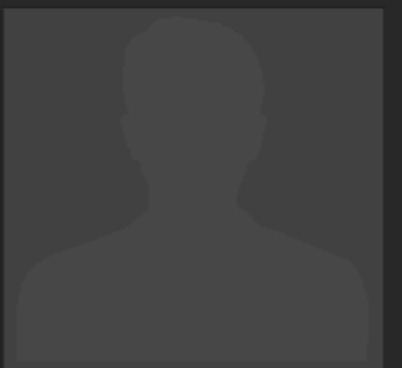


ID : 1229317

Age : 47
Occupation : EXECUTIVE
Number of Policies : 7

RISK FUNCTIONS

- No. of Claims : 38
- Total Claim Amount : 554K
- Average Claim Amount : 14K
- Total Length of Stay : 156.0
- Average Length of Stay : 4.875
- No. of Early Claims : 1
- No. of Frequent Re-admission Sam...

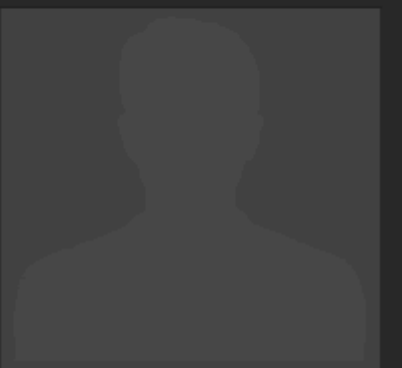


ID : 511

Age : 48
Occupation : BUSINESSMAN
Number of Policies : 4

RISK FUNCTIONS

- No. of Claims : 24
- Total Claim Amount : 89K
- Average Claim Amount : 3.7K
- Total Length of Stay : 59.0
- Average Length of Stay : 3.6875
- No. of Early Claims : 0
- No. of Frequent Re-admission Sam...

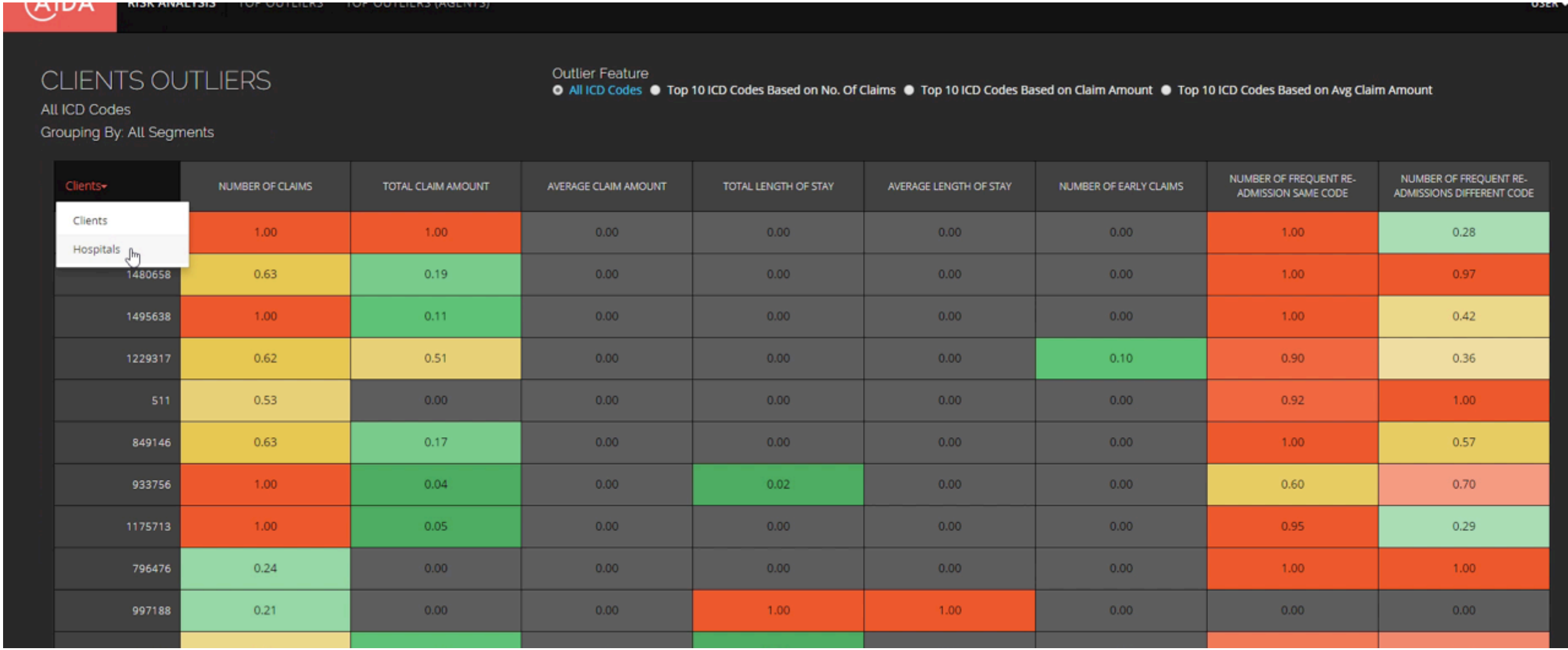


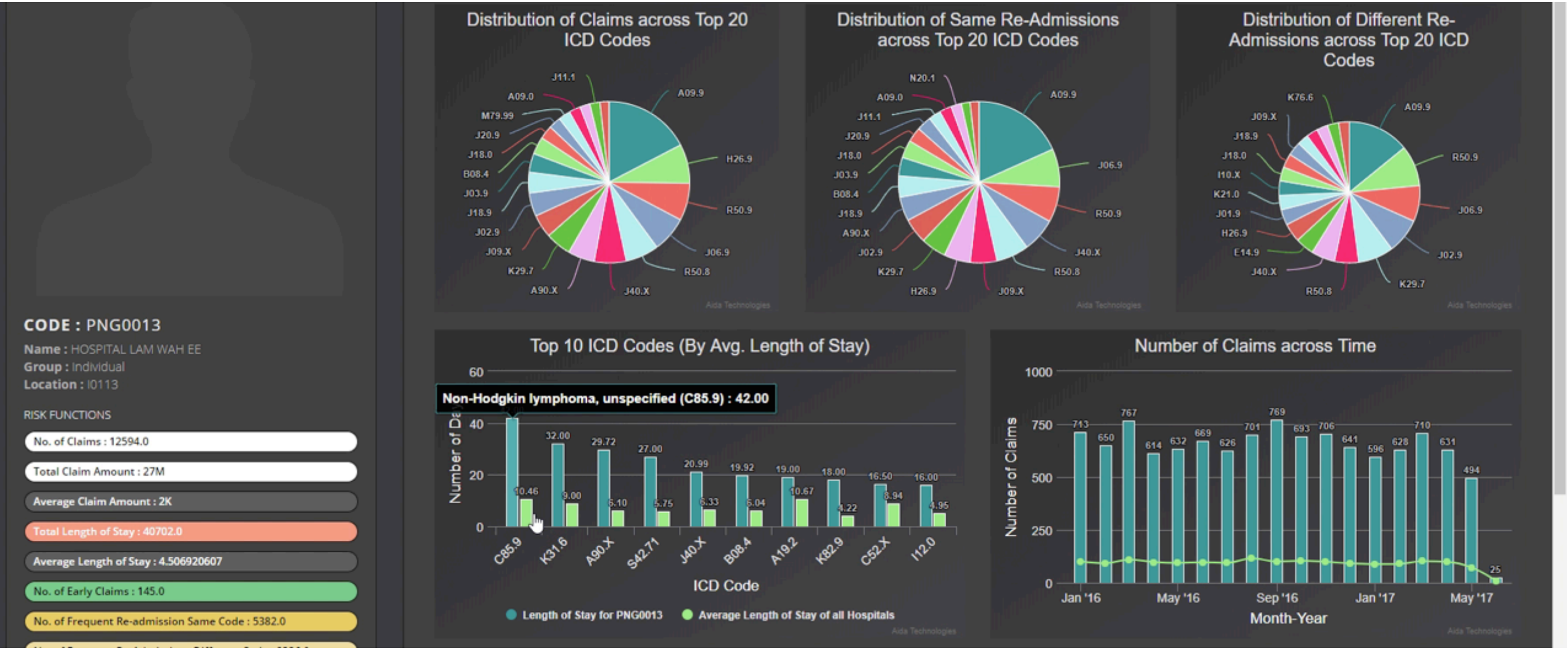
ID : 849146

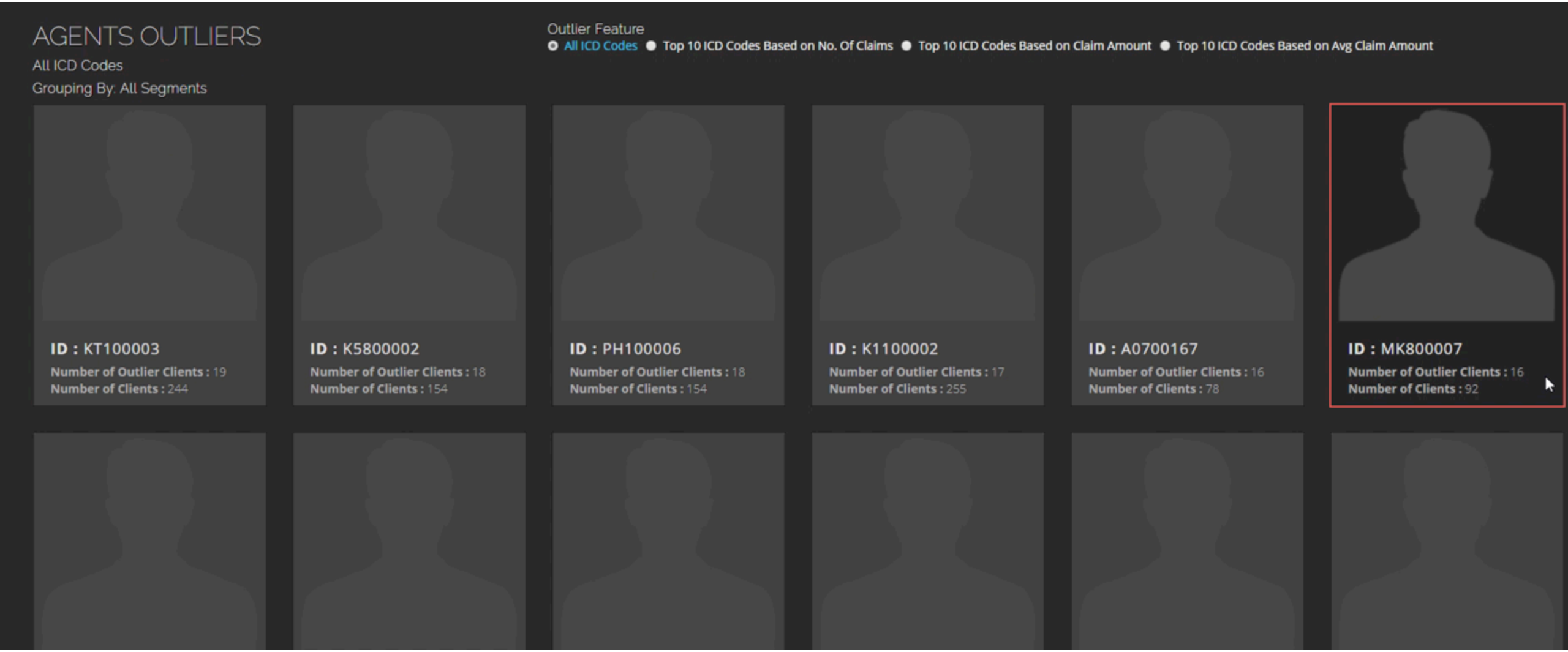
Age : 22
Occupation : TEACHER
Number of Policies : 2

RISK FUNCTIONS

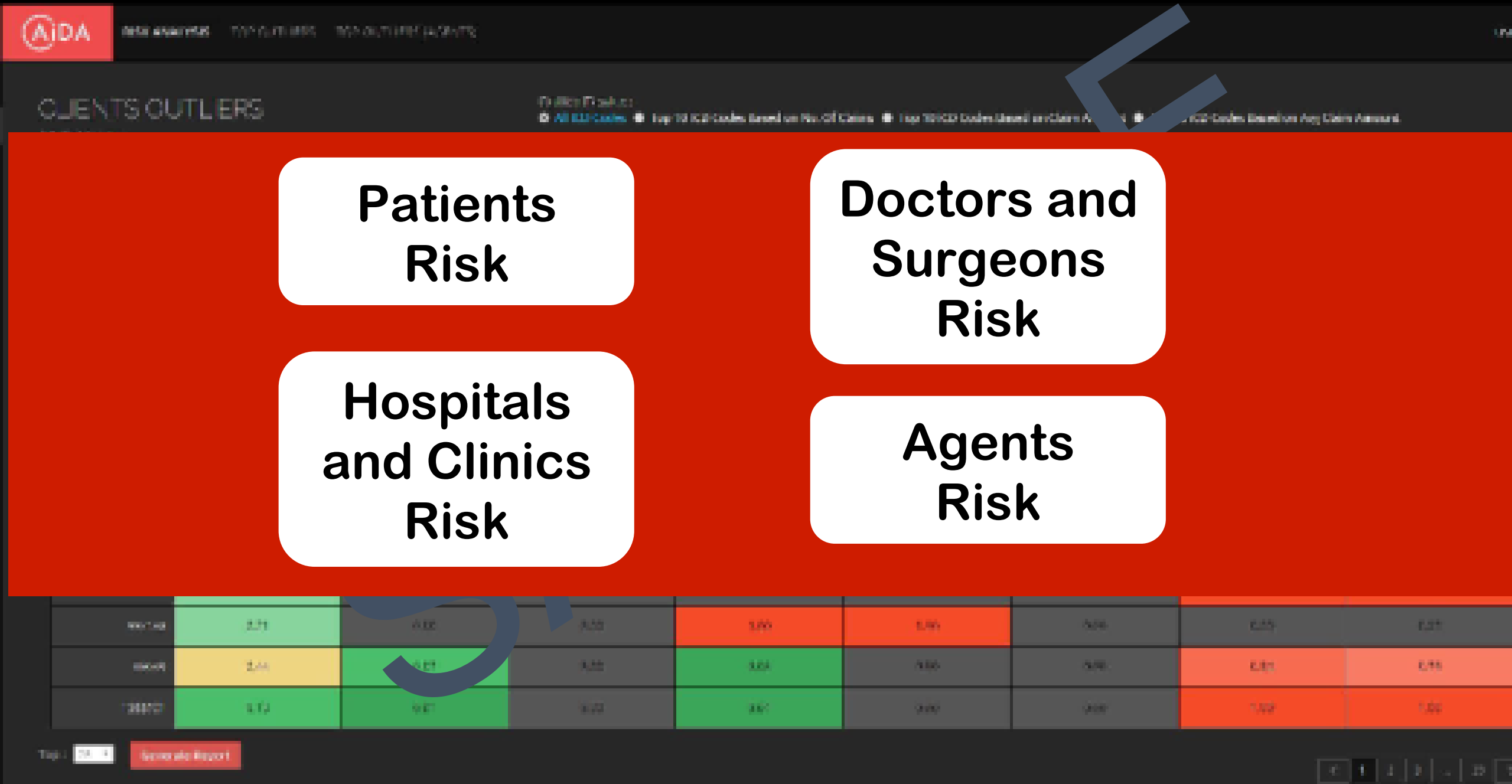
- No. of Claims : 28
- Total Claim Amount : 125K
- Average Claim Amount : 4.4K
- Total Length of Stay : 106.0
- Average Length of Stay : 5.0476190...
- No. of Early Claims : 0
- No. of Frequent Re-admission Sam...


AIDA
CLIENTS OUTLIERS
All ICD Codes
Grouping By: All Segments
Outlier Feature
All ICD Codes
Top 10 ICD Codes Based on No. Of Claims
Top 10 ICD Codes Based on Claim Amount
Top 10 ICD Codes Based on Avg Claim Amount
Clients
Clients
Hospitals
NUMBER OF CLAIMS
TOTAL CLAIM AMOUNT
AVERAGE CLAIM AMOUNT
TOTAL LENGTH OF STAY
AVERAGE LENGTH OF STAY
NUMBER OF EARLY CLAIMS
NUMBER OF FREQUENT RE-ADMISSION SAME CODE
NUMBER OF FREQUENT RE-ADMISSIONS DIFFERENT CODE
1.00 1.00 0.00 0.00 0.00 0.00 1.00 0.28
1480658 0.63 0.19 0.00 0.00 0.00 0.00 1.00 0.97
1495638 1.00 0.11 0.00 0.00 0.00 0.00 1.00 0.42
1229317 0.62 0.51 0.00 0.00 0.00 0.10 0.90 0.36
511 0.53 0.00 0.00 0.00 0.00 0.00 0.92 1.00
849146 0.63 0.17 0.00 0.00 0.00 0.00 1.00 0.57
933756 1.00 0.04 0.00 0.02 0.00 0.00 0.60 0.70
1175713 1.00 0.05 0.00 0.00 0.00 0.00 0.95 0.29
796476 0.24 0.00 0.00 0.00 0.00 0.00 1.00 1.00
997188 0.21 0.00 0.00 1.00 1.00 0.00 0.00 0.00


CODE : PNG0013
Name : HOSPITAL LAM WAH EE
Group : Individual
Location : I0113
RISK FUNCTIONS
No. of Claims : 12594.0
Total Claim Amount : 27M
Average Claim Amount : 2K
Total Length of Stay : 40702.0
Average Length of Stay : 4.506920607
No. of Early Claims : 145.0
No. of Frequent Re-admission Same Code : 5382.0
Distribution of Claims across Top 20 ICD Codes
J11.1
A09.0
M79.99
J20.9
J18.0
B08.4
J03.9
J18.9
J02.9
J09.X
K29.7
A90.X
J40.X
R50.8
J06.9
R50.9
H26.9
A09.9
Distribution of Same Re-Admissions across Top 20 ICD Codes
N20.1
A09.0
J11.1
J20.9
J18.0
J03.9
B08.4
J18.9
A90.X
J02.9
K29.7
H26.9
J09.X
R50.8
J40.X
R50.9
J06.9
A09.9
Distribution of Different Re-Admissions across Top 20 ICD Codes
K76.6
J09.X
J18.9
J18.0
I10.X
K21.0
J01.9
H26.9
E14.9
J40.X
R50.8
K29.7
J02.9
J06.9
R50.9
A09.9
Top 10 ICD Codes (By Avg. Length of Stay)
Non-Hodgkin lymphoma, unspecified (C85.9) : 42.00
Number of Da
60
40
20
0
10.46
32.00
9.00
29.72
6.10
27.00
5.75
20.99
6.33
19.92
6.04
19.00
10.67
18.00
4.22
16.50
6.94
16.00
4.95
C85.9
K31.6
A90.X
S42.71
J40.X
B08.4
A19.2
K82.9
C52.X
I12.0
ICD Code
Length of Stay for PNG0013
Average Length of Stay of all Hospitals
Number of Claims across Time
1000
750
500
250
0
Number of Claims
713
650
767
614
632
669
626
701
769
693
706
641
596
628
710
631
494
25
Jan '16
May '16
Sep '16
Jan '17
May '17
Month-Year


AGENTS OUTLIERS
All ICD Codes
Grouping By: All Segments
Outlier Feature
All ICD Codes
Top 10 ICD Codes Based on No. Of Claims
Top 10 ICD Codes Based on Claim Amount
Top 10 ICD Codes Based on Avg Claim Amount
ID : KT100003
Number of Outlier Clients : 19
Number of Clients : 244
ID : K5800002
Number of Outlier Clients : 18
Number of Clients : 154
ID : PH100006
Number of Outlier Clients : 18
Number of Clients : 154
ID : K1100002
Number of Outlier Clients : 17
Number of Clients : 255
ID : A0700167
Number of Outlier Clients : 16
Number of Clients : 78
ID : MK800007
Number of Outlier Clients : 16
Number of Clients : 92

RISK ANALYSIS - HEATMAP



AIDA – SMART-CLAIMS
Business Case Analysis

AI Driven Analytics

AIDA SMART-Claims

Key Benefits of Machine Learning for Claims Processing:

✓ **OPERATIONAL BENEFITS - Cost Per Claim Reduction**

Number of Claims Per Month	Cost of Processing Per Claim (Dollars)	Total Claims Processing Cost Per Month (Dollars)	% of STP Claims Through ML Engine	Reduction in Cost of Processing Per Claim (Dollars)	Total Cost Savings in Claims Processing Per Month (Dollars)
10000	50	500,000	@ 50 %	25	250,000
20000	40	800,000	@ 60 %	24	480,000
….					

@ 240,000 Claims Per Annum
@ 40 Dollars Per Claim
@ 60% STP Through Machine Learning
Potential Savings Per Annum: $5.76 Million

AIDA SMART-Claims Introduction

Key Benefits of Machine Learning for Claims Processing:

- ✓Significant Cost Savings (>$5M/annum for 20K claims/month)
- ✓Faster Claims Turn-Around (days to seconds)
- ✓Augmented Intelligence to Support Specialist Claims Officers
- ✓Organisational Knowledge by Continuous Learning By Machines
- ✓Scalable to Increased Claim Volumes
- ✓Early Detection of Potentially Suspicious and Unusual Claims

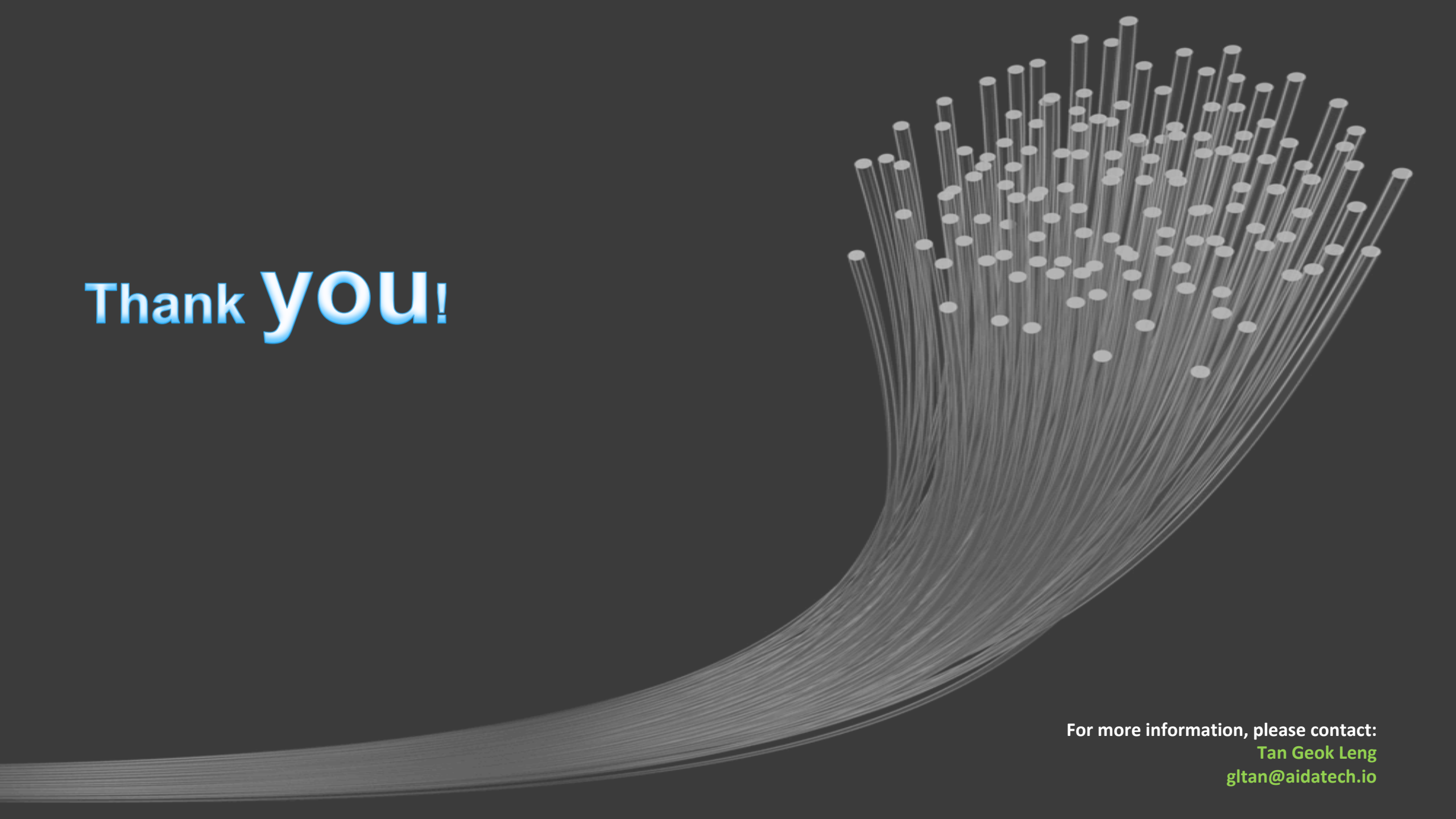
AIDA – SMART-CLAIMS

Taking the Solution from Singapore into the region.

AI Driven Analytics

Taking AIDA's Smart Claims beyond Singapore into Thailand, Indonesia, Malaysia, Hong Kong and Japan

Thank you!



For more information, please contact:
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gltan@aidatech.io