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an analytics organization
www.assetplusconsulting.com

FOUNDED BY WOMEN ENTREPRENEUR
EX MICROSOFT & INFOSYS

#startupindia

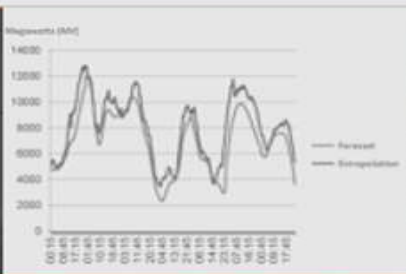BIG DATA | AI | MACHINE LEARNING | DEEP LEARNING | BLOCK CHAIN

A STARTUP WITH A SOCIAL VISION
BY TEAM OF TECHNOCRATS & MANAGEMENT PROFESSIONALS

| Grid Management | Forecasting couple with Optimized Procurement | Revenue Protection & Power Theft (NTL) | Revenue Assurance & Leakage Protection (UFG) | Un-Accounted for Water (UFW) | Solar & Wind Analytics Operation Managemen |

A GOVT OF INDIA ACREDITED AND RECOGNIZED START UP

A MINISTRY OF MSME RECOGNIZED START UP

DEVELOPMENT COMMISSIONERATE MINISTRY OF MSME

ADVISORY
Support utilities in economically identifying Value driven transformational opportunity

SOLUTIONS
Applying simpler technologies creating larger value for Utilities

CAPACITY BUILDING
Training utilities to understand Small change creating BIG Transformation In their own eco-system

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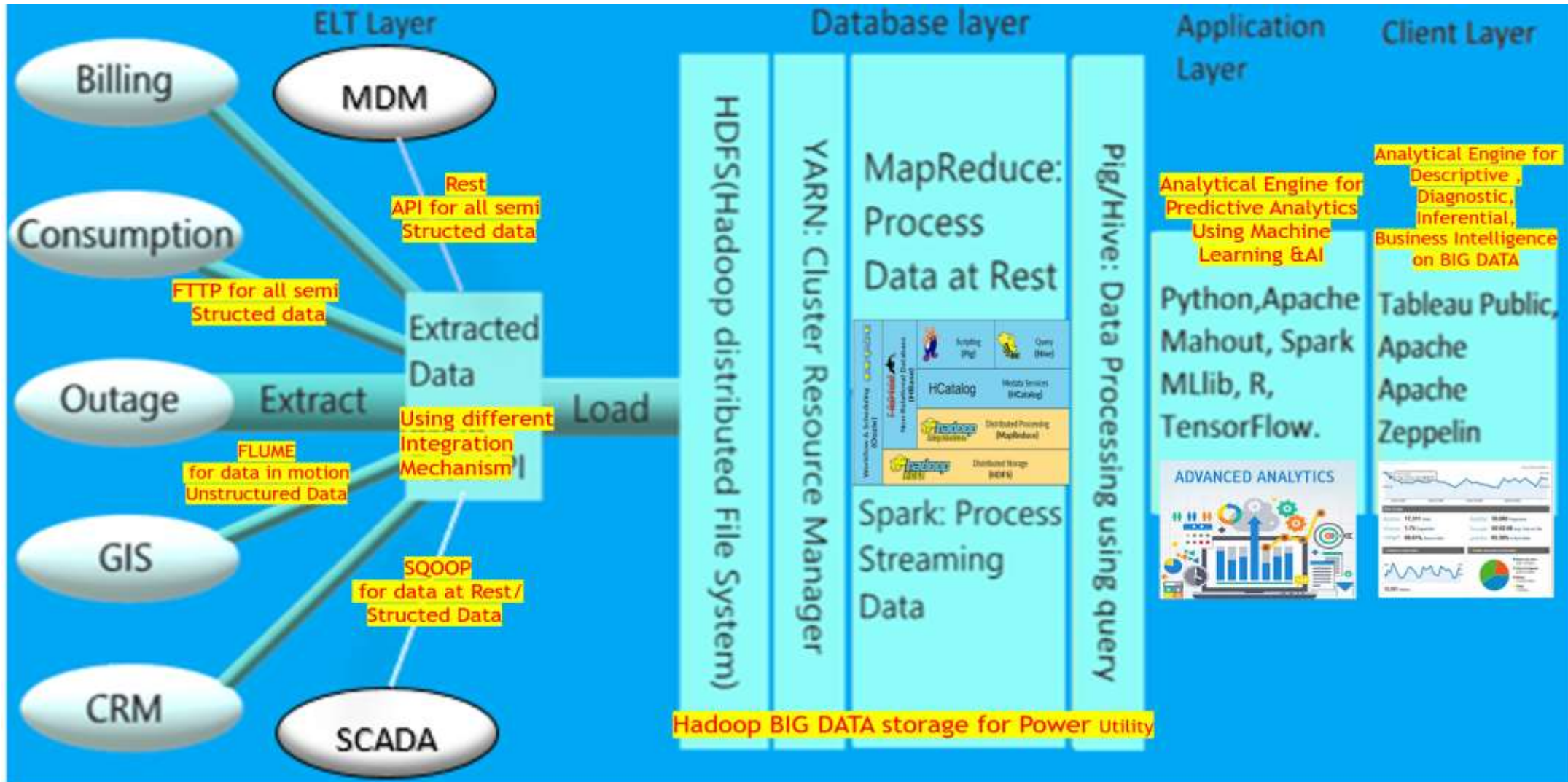www.assetplusconsulting.com

REVENUE MAXIMIZATION & LOSS MINIMIZATION

Enhancing your Business Value for Utilities
using Decision Science Methodology

Utilities (Power, Gas, Water)
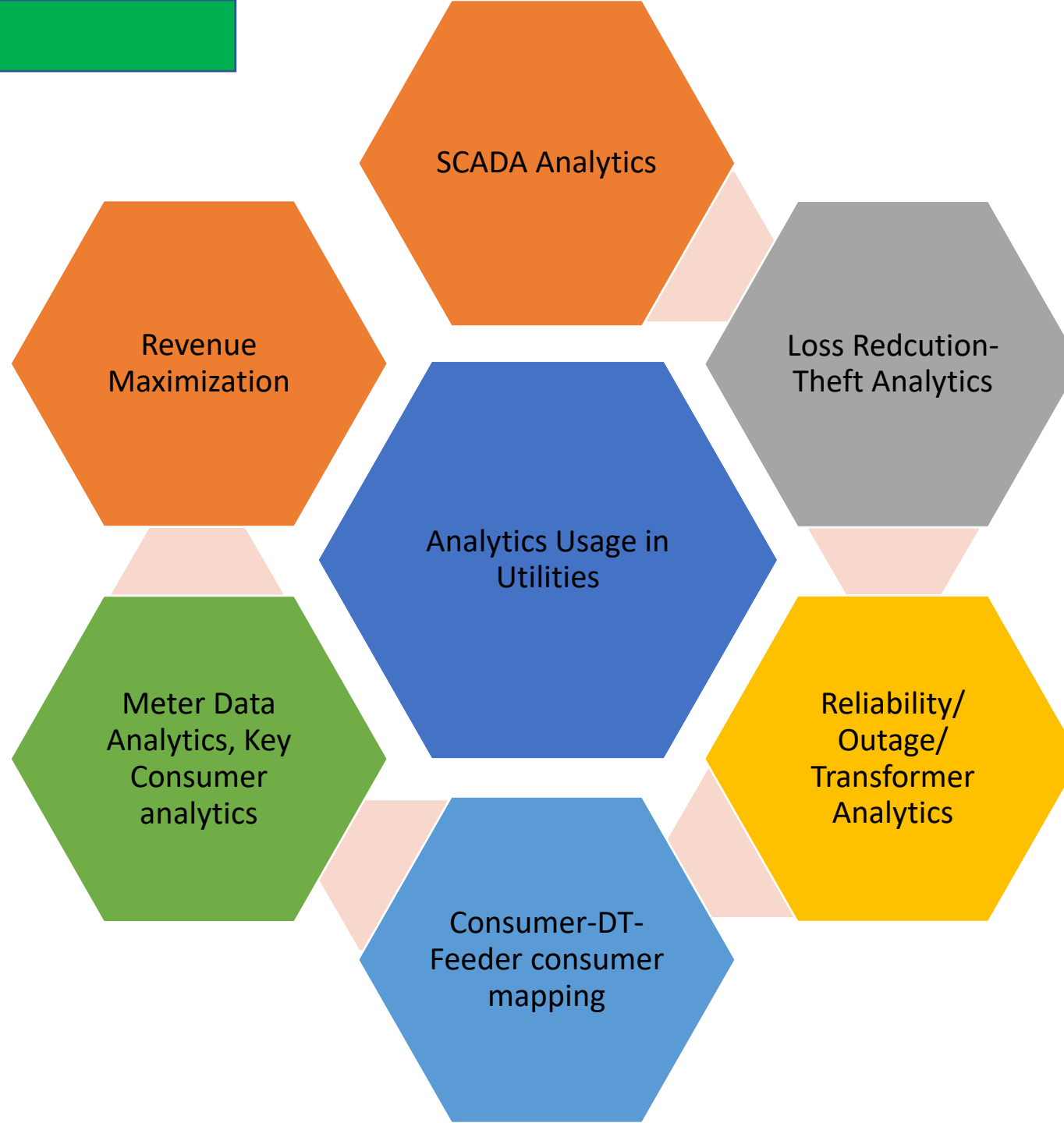
Advanced ARTIFICIAL INTELLIGENCE solution to implementation approach

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Data lake adoption(for Utility)

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Revenue Maximization

Defaulter predictive management system based on AI

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Million of Customers

Mutiple District/Division

~xxx Cr Billing per Month*

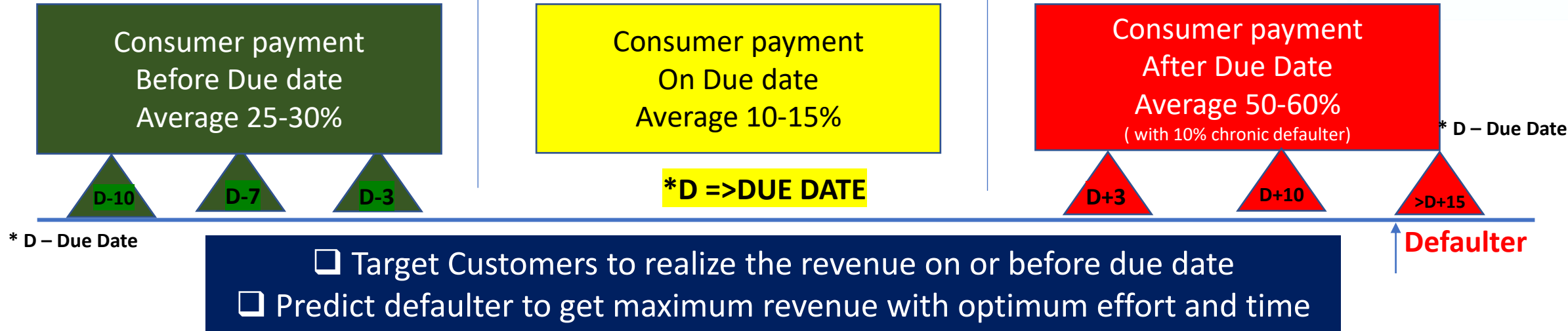*Assumption(Info Available on Web)

~xxx Cr Billing Not Recognized Month*

*Assumption(Info Available on Web)

APC REVENUE RECOGNIZATION Solution – Proposed Benefit

xxCr Per Month

Any Utility

Existing scenario for utilities

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A P P R O A C H

Consumer payment
Before Due date
Average 25-30%

Consumer payment
On Due date
Average 10-15%

Consumer payment
After Due Date
Average 50-60%
(with 10% chronic defaulter)

* D – Due Date

D-10   D-7   D-3

*D =>DUE DATE

D+3   D+10   >D+15

* D – Due Date

❑ Target Customers to realize the revenue on or before due date
❑ Predict defaulter to get maximum revenue with optimum effort and time

Defaulter

SOLUTION – WORKING METHDOLOGY

➤ Focus is to move consumer closer to **DUE DATE** to Realize early revenue for Utility
   ❑ Strategy based on APC Solution
      ❖ **Target D+3 and D + 10** people to move to earlier bucket ~ 10-20% earlier revenue recognition
         ❖ [**Estimate 5-10 Cr pm revenue recognition**] → *SOFT TARGET (in division or district with average 1 lakh consumers)*

      ❖ **Target Defaulter → >D+15, 40-50% of Revenue losses/delay** ~Applying AI/ML Solution 5-10% consumer movement
         ❖ [**Estimate – 10-30 Cr pm revenue recognition**] HARD TARGET *(in division or district with average 1 lakh consumers)*

S O L U T I O N

OVERALL IMPACT OF ~**400-500 CR** Yearly

SOLUTION

BUSINESS CASE STUDY - DELHI BASED POWER DISTRIBUTION

A LIVE RUNNING ENGAGEMENT

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DATA DRIVEN

REVENUE MAXIMIZAION & LOSS MINIMIZATION

~150 Cr pm

Billing Realization by Decision Science Methodology Implemented

~17 Lakhs Consumers across 3 Regions and 17 Division

~200 Cr
Billing at stake per month

~500 Cr Billing amount generated per month

~200 Cr Billing Collected per month

TRANSFORMATION

Bucketing
- Business Insights
- Dynamic Bucketing
- Input to existing KPI
- Information available at customer level for better decisioning

Defaulter Modeling
- Prediction of Defaulter /Customer Behavior
- Prevention of Revenue Leakage
- Revenue Management
- Input for Scoring

Risk Profiling
- Customer Segmentation
- Profiling of Customer based on bucket/region
- Risk Scoring
- Final Risk for each customer

❖ Powered by open source methodologies
❖ Cutting Edge AI/ML Capabilities
❖ Full Support by highly skilled resources
❖ Low cot
❖ Easy to manage

VALUE ADDITION

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BENEFIT - UTILITY REALIZE 50-60% OF REVENUE ON Before DUE DATE

Dynamic Bucketing

Feedback Mechanism to Optimize Business Operation

Customer Payment Behavior Analysis

Revenue Recognition and Management

Campaign Management

Customer Rating

Strategy for Payment Maximization

Default Prediction

AI/ML Model (Decision Science Methodology)

	Input	Output	Benefits	Tool/Technology
Customer Segmentation Model	Customer Data from different Sources	Segmentation based on Attributes:- Area , Code, Payment Days	➢ Better and Customized Campaign Reporting	OPEN SOURCE SOLUTION STACK ✓ Artificial Intelligence ✓ Machine Learning ✓ Deep Learning
Customer Default Model	Customer Data from different Sources	Probability of Default of each customer	➢ Prevention of Revenue Leakage	
Customer Payment Prediction Model	Customer Data from different Sources	Probability of customer payment ▪ Before N day ▪ After N Day	➢ Revenue Management	

STRATEGY FOR EARY CUSTOMER PAYMENT

TURN AROUND FOR UTILITY

Customer Segmentation Model : Payment Bucket

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Significant Findings

Category	April		May		June		July	
	Customer	Payment_Amount	Customer	Payment_Amount	Customer	Payment_Amount	Customer	Payment_Amount
<D-3	20867	37465940	21803	67933245	20219	64215674	21248	87768918
D-3	13641	30550690	11952	35589025	12924	46457585	13659	71237422
D	13962	24711202	8925	35716657	9968	43957998	10623	63451668
D+3	6895	15633410	9298	30076006	9487	53982090	11246	52229330
>D+3	7171	17792677	10355	39773421	11916	51639226	13450	67532828
Defaulter	33799		24869		29090		26694	
Not To pay	12108		13549		7522		4283	

Category	Aug		Sep		Oct		Nov	
	Customer	Payment_Amount	Customer	Payment_Amount	Customer	Payment Amount	Customer	Payment_Amount
<D-3	20601	61650191	20526	91325506	25349	104513091	20285	76751848
D-3	12006	34542667	13122	67724618	14209	52068985	15228	46642012
D	8245	24986384	9942	47721655	9225	48313369	10615	35432651
D+3	9756	31248591	11487	54075143	8708	42215866	11687	47405697
>D+3	14752	50008870	13986	76614908	12412	61371520	9486	40283323
Defaulter	6348		27919		28486		31455	
Not To pay	26567		4534		3432		2866	

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Individual Customer Behavior Analysis

Significant Findings

CONSUMER_NO	Bucket_April	Bucket_May	Bucket_Jun	Bucket_Jul	Bucket_Aug	Bucket_Sep	Bucket_Oct	Bucket_Nov
100457940	Default	D	Default	>D+3	>D+3	>D+3	>D+3	>D+3
151720530	Default	Default	<D-3	Default	Default	Default	Default	Default
151305465	Default	<D-3	<D-3	<D-3	D	D-3	<D-3	Default
100502429	Default	Default	<D-3	Default	>D+3	Default	<D-3	Default
100447000	<D-3	<D-3	<D-3	<D-3	Default	<D-3	Default	<D-3
151576829	D-3	Default	<D-3	Default	<D-3	D	<D-3	D
152125829	D	>D+3	Default	D	>D+3	Default	D	>D+3
151786540	>D+3	>D+3	>D+3	>D+3	>D+3	>D+3	>D+3	>D+3
100418786	Default	Default	Default	D+3	Default	Default	Default	Default
150521027	Default	D-3	Default	<D-3	D+3	Default	<D-3	Default

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Prediction of Payment Behavior – Default Model

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Significant Findings

- Model Accuracy

Actual_Default_Oct	31554
Predicted_Default_Oct	23175
Accuracy	~73%
Total Value(Actual)	~11 Cr
Total Value (Predicted)	~9 Cr (~81%)
Actual_Default_Nov	33915
Predicted_Default_Nov	20280
Accuracy	~60%
Total Value(Actual)	~12 Cr
Total Value (Predicted)	~7.5 Cr (~61%)

STRATEGY FOR CUSTOMER IMPACT

REVENUE ENHANCEMENT BY CASH FLOW IMPORVEMENT TO THE TUNE OF 150 CR PM

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HOME PAGE

PAYMENT BEHAVIOUR ANALYSIS

SEASON EVENT ANALYSIS

SEASON/EVENT ANSLYSIS

MULTIPLE SELECTION
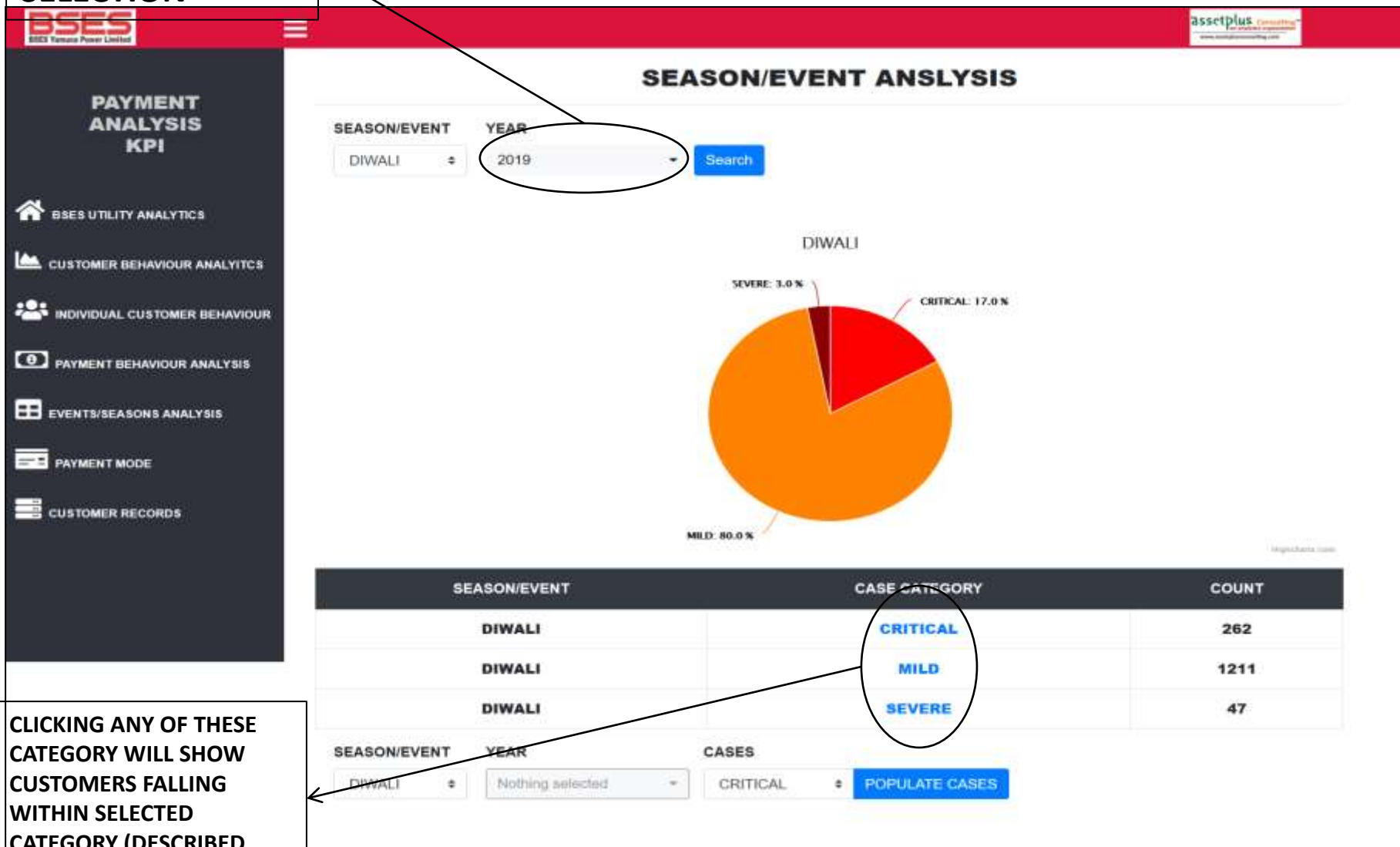
CLICKING ANY OF THESE CATEGORY WILL SHOW CUSTOMERS FALLING WITHIN SELECTED CATEGORY (DESCRIBED BELOW)

CONSUMPTION VS PAYMENT DAY VS TEMPERATURE

CUSTOMER NUMBER ARE POPULATED AS PER YEAR AND CASE SELECTION
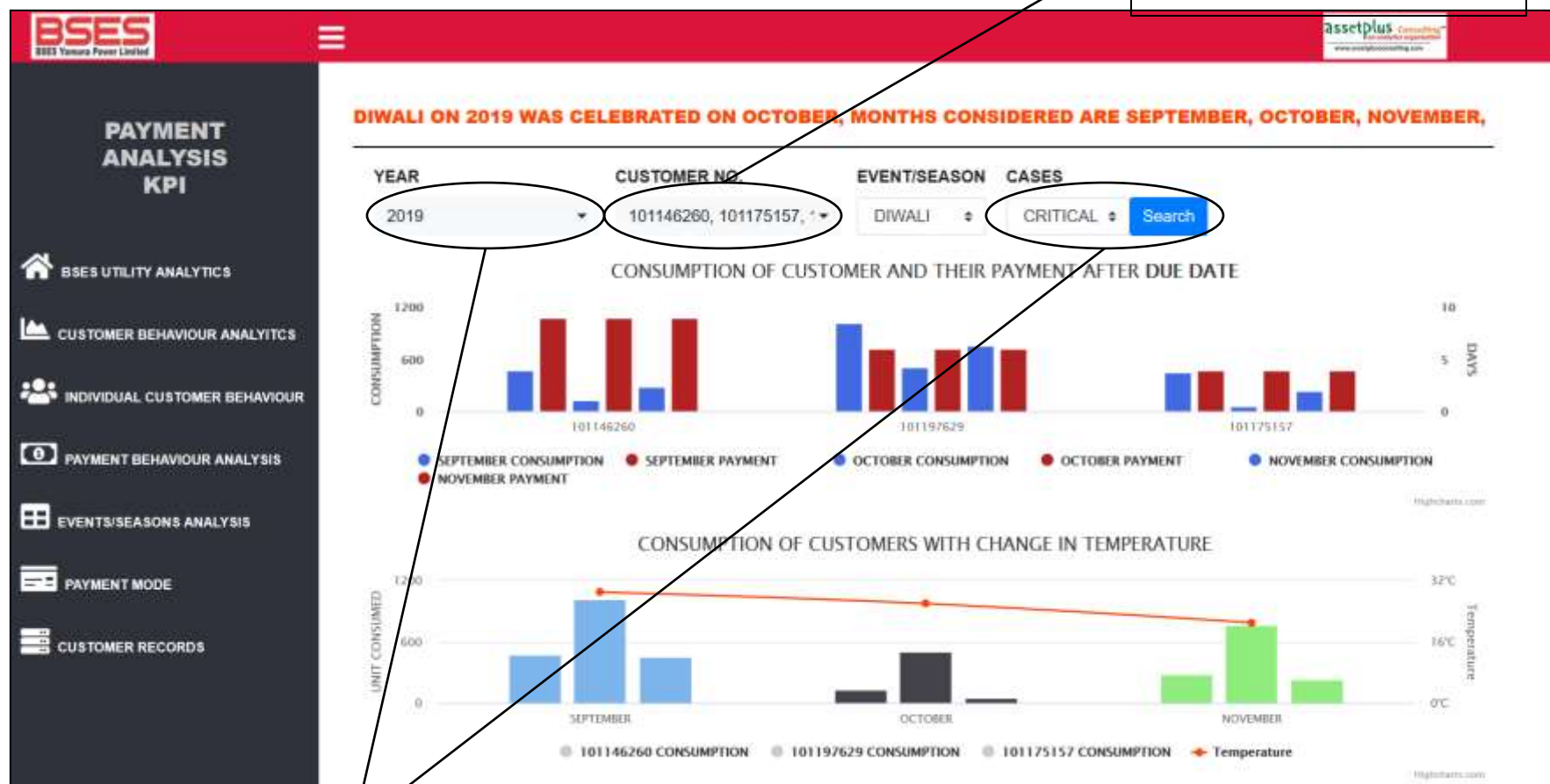
TO CHANGE TTHE YEAR AND CASE CATEGORY USER CAN SELECT DESIRED YEAR AND CASE CATEGORY TO CHANGE THE CUSTOMERS FALLING WITHIN SELECTED OPTTIONS

PAYMENT MODE
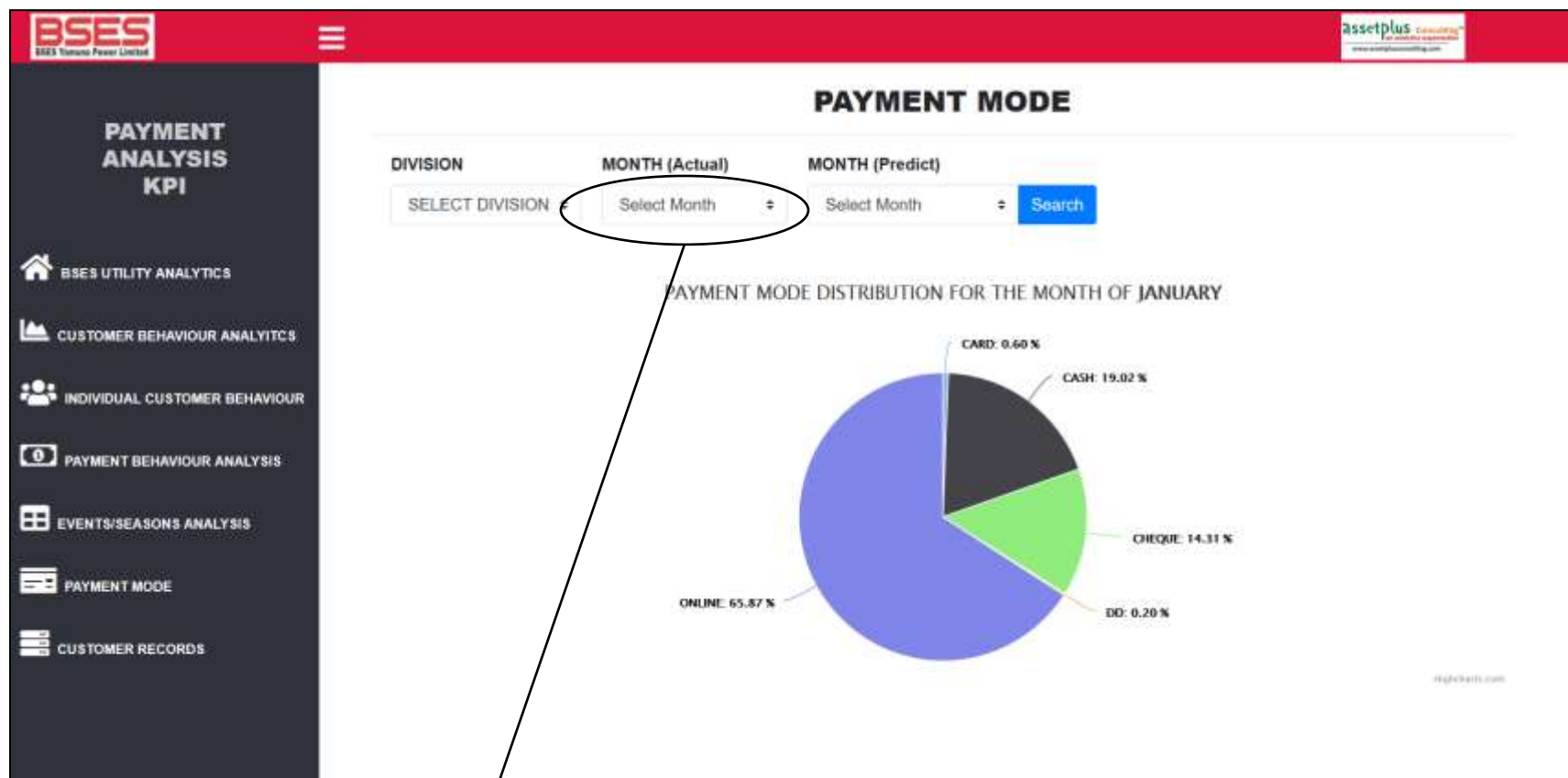
SELECTING ONLY MONTH(Actual) WILL SHOW PAYMENT MODE'S DISTRIBUTION FOR THAT MONTH

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Loss Minimization

* Controlling pilferage point based on AI solution

* Reducing the operation cost of metering Billing and Collection (CLK2PAY)

* Tagging of Network from Substation to DT to LV feeder to Pole to End Customer

* Tracking of the field force for their operation efficiency

Enhancing the bottom line

MINIMIZATION OF LOSS– FINDING PILFERAGE POINT IN MY CUSTOMER
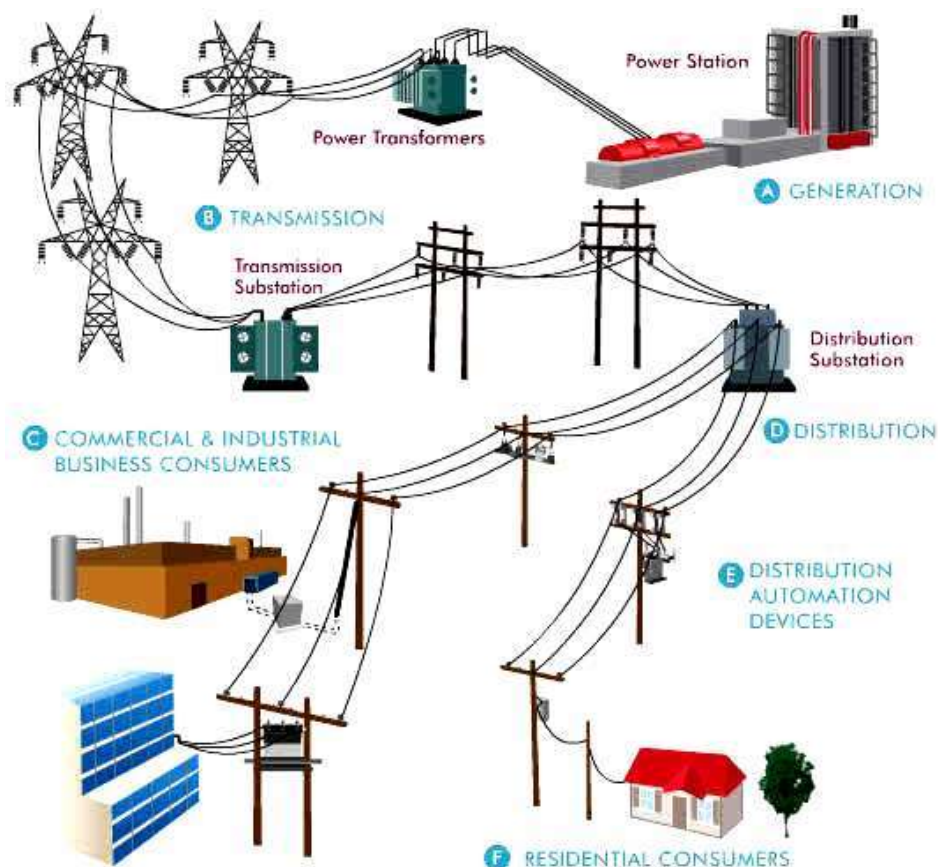
PROBLEM STATEMENT- FINDING PILFERAGE POINTS IN DOMESTIC CATEGORY

Methods for plugging the leakage

Narrowing the Variables

Suspect identification can done using the information provided by this data set

Suspect

Consumption

Event

Technical Factors

Billing Details
Study About the billing pattern of customer and studying the lag in payment

Daily/Monthly

Capacity

Meter Id
1) Event Objective
2) Relation
3) Consumption

VIC
1) CT- Current Issue
2) PT- Phase Issue
3) VT- Voltage Issue

Data is cleaned to make it more authentic on Keeping these factors as primary factors for algorithm application.

1) Consuming meter capacity, paying on time or Delayed.
2) Comparison on the basis of events and self trend.
3) Setting 30% of the confidence level

1) Average Consumption of Group.
2) Average consumption of self.
3) Combined with self details.

- Meter Consumption data daily/monthly (historical)

- Meter event data

- Billing data

- Payment data

- MRD file

- Customer complain

Strengthening the bottom line
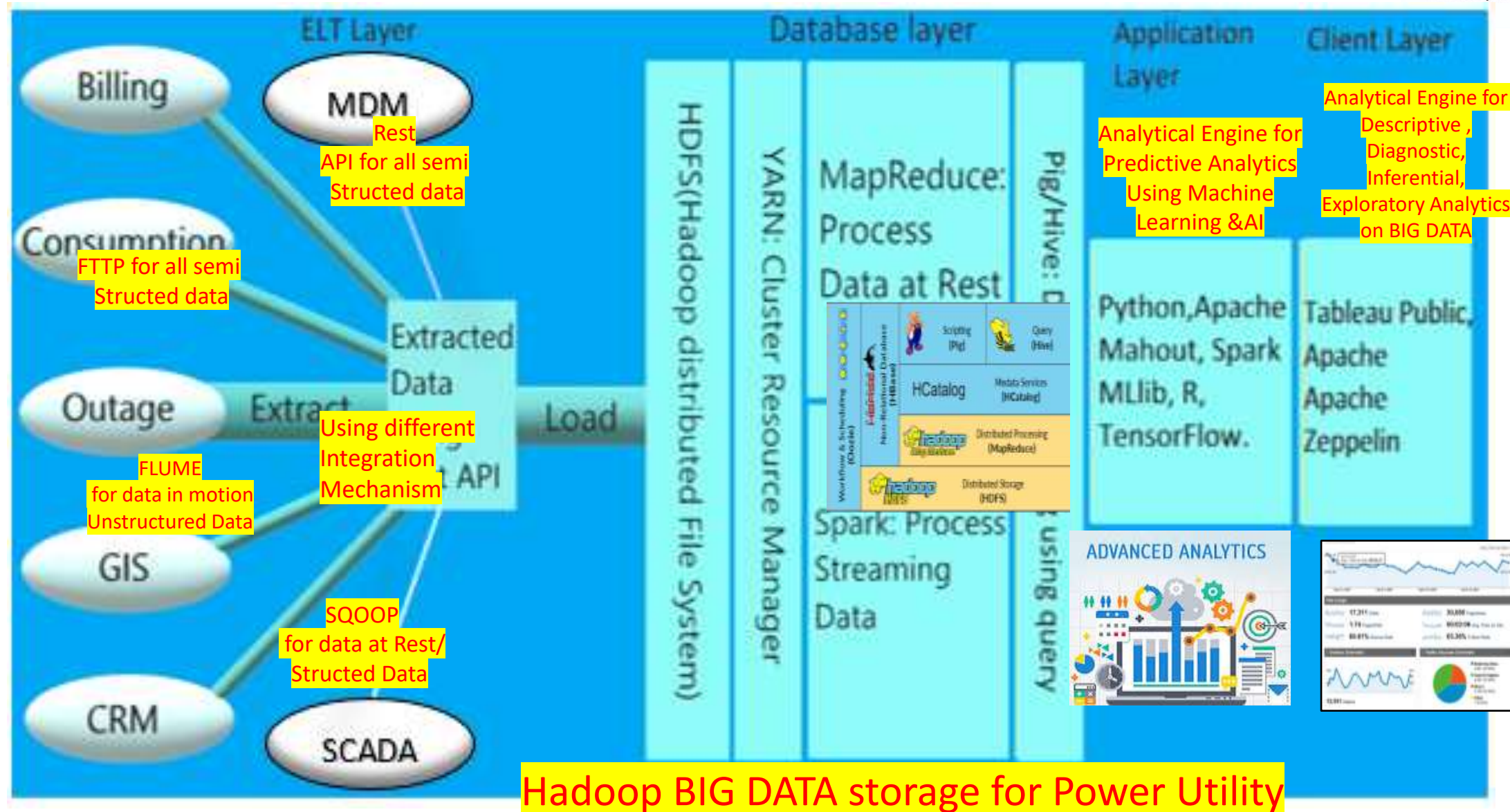
Hadoop BIG DATA storage for Power Utility

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Applying RAMDOM FOREST Models
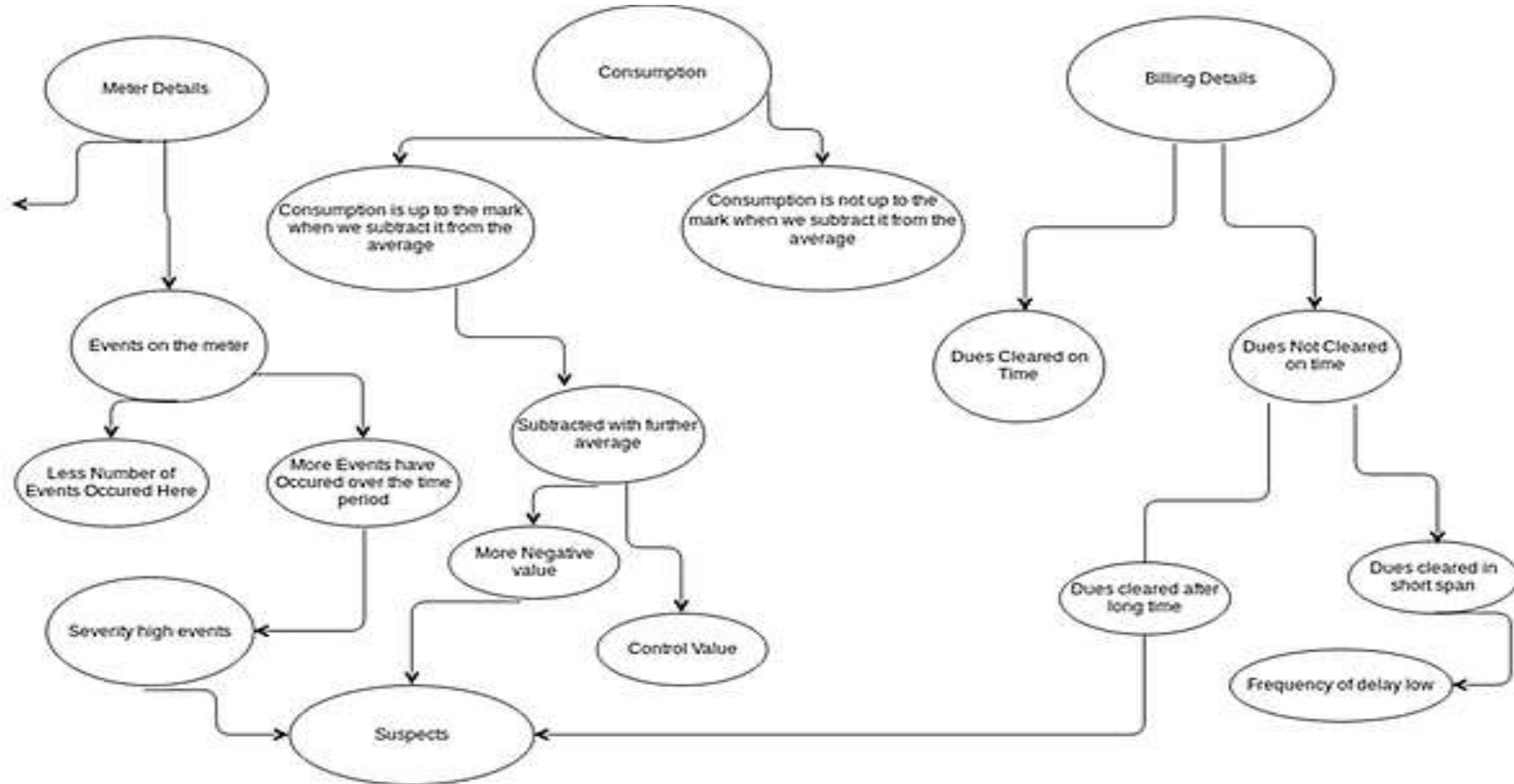
PINNING THE PILFERAGE POINTS WITH 99% ACCURACY

ARTIFICIAL INTELLIGENCE at Work

HOME PAGE

DASHBOARD

DASHBOARD provides a brief overview of total number of GRIDs, total number of DT, total number of customers each block

NETWORK GRAPH SHOWING DISTRIBUTION
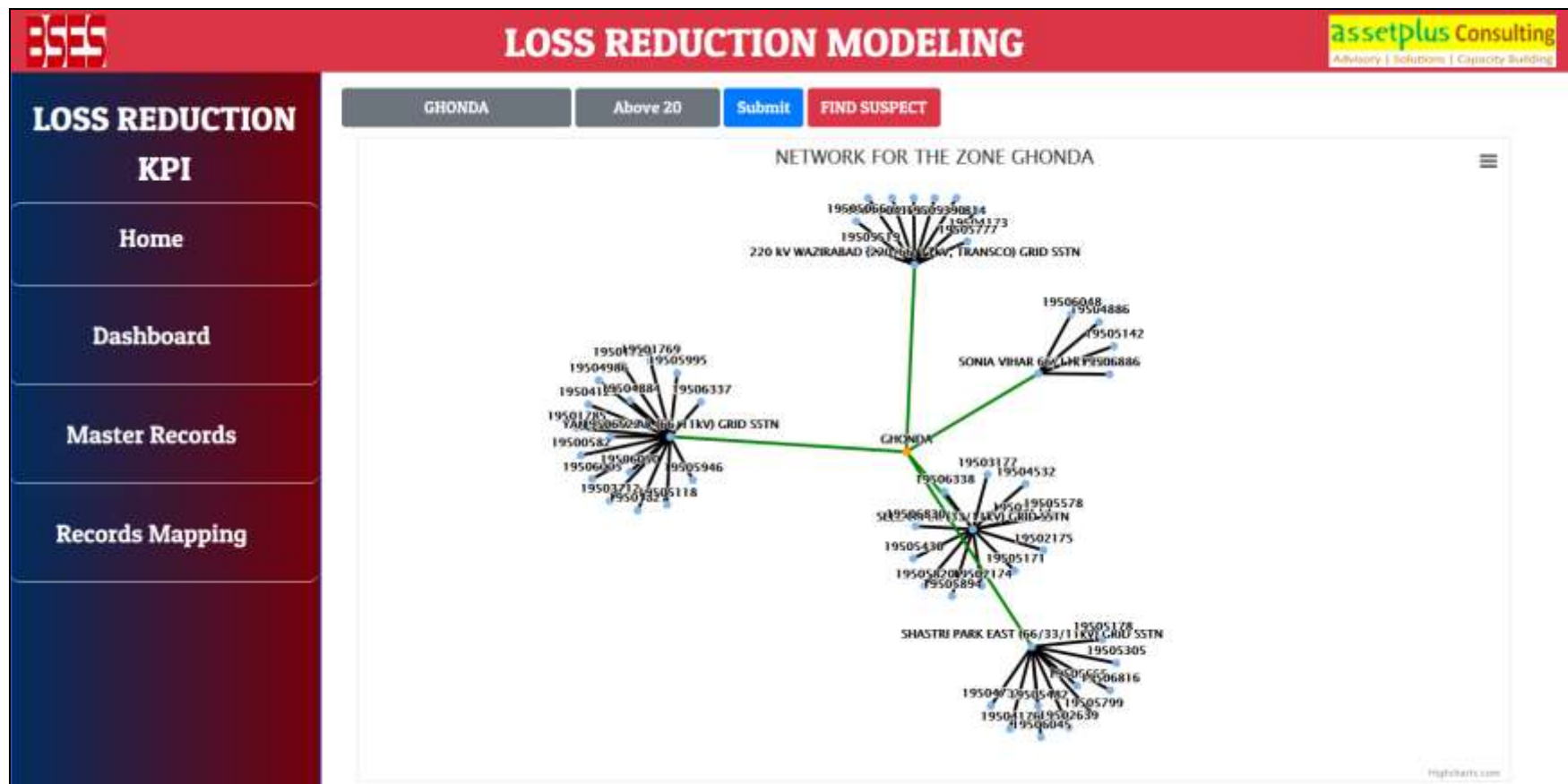
SUSPICIOUS BEHAVIOUR DASHBOARD

Here the dashboard will reveal the suspicious behaviour of customers where the suspects are categorised into three different categories, which can be accessed by the user through dropdown option

1. **CRITICAL SUSPECTS**
2. **SEVERE SUSPECTS**
3. **MILD TO SEVERE SUSPECTS**

CUSTOMER'S OVERVIEW

Loss Minimization

* Controlling pilferage point based on AI solution

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* Tagging of Network from Substation to DT to LV feeder to Pole to End Customer

* Tracking of the field force for their operation efficiency

TAGGING PROJECT (VERIFICATION OF CONSUMER MAPPING TO THE POLE)

DATA ANALYTICS DRIVEN ANAMOLY DETECTION-

BY USE OF

TEXT MINING METHODLGY WITH HEURISTIC BASED MODELLING

CONSUMER MAPPING FROM SSTN _DT_ FEEDER_POLE

STANDARDISATION OF ADDRESS

TOKENIZATION the string of addresses into
'HOUSE NUMBER', 'KHASRA NUMBER', 'FLOOR',
'SUBLOCALITY', 'LOCALITY', 'CITY', 'PINCODE'
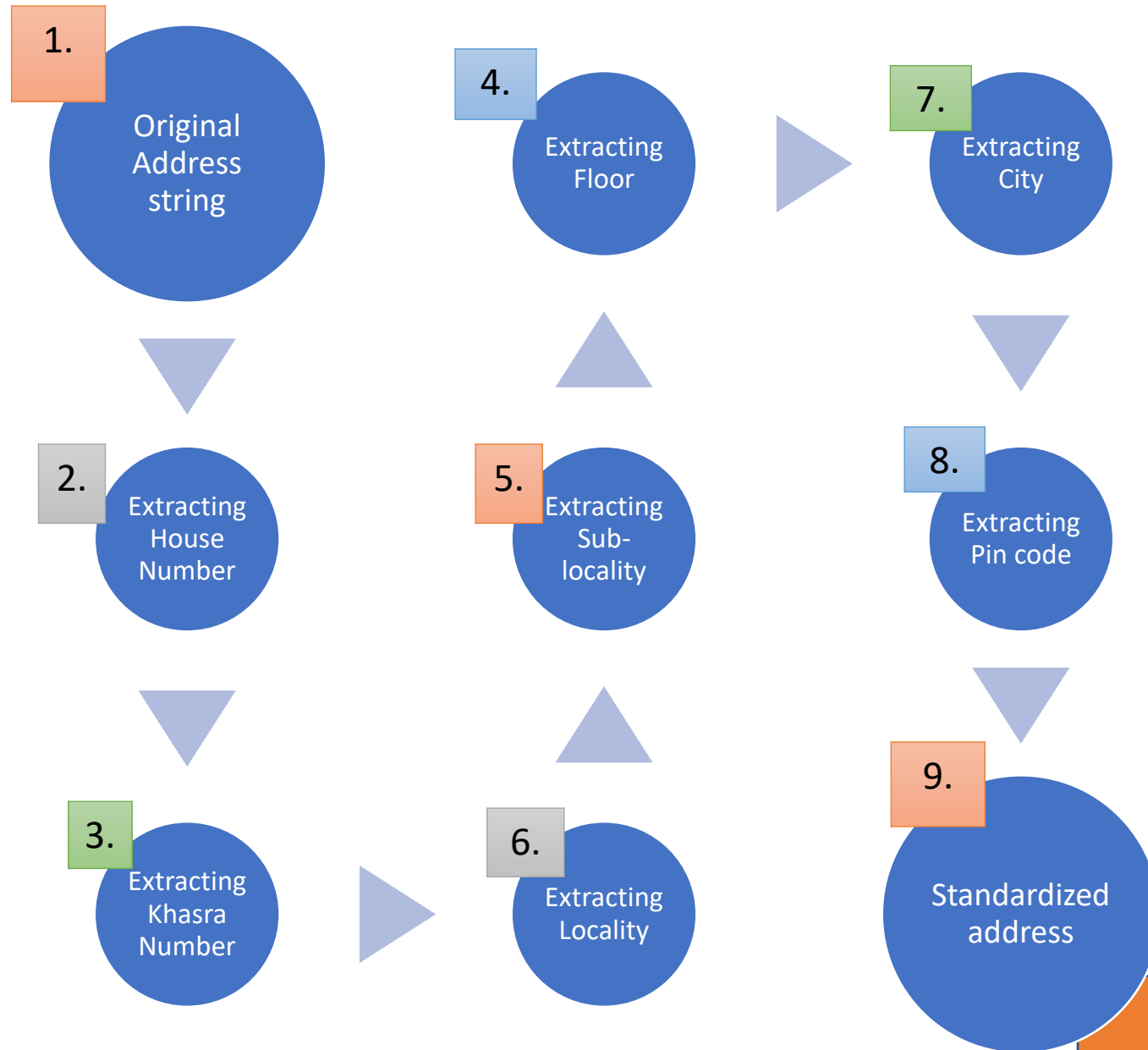
House No A-20 — Khasra No 393/265 — Sub-locality — Pin code

A-20, KH NO 393/265, 4/F , NEW ASHOK NAGAR, #, 110096

Data Processing Steps

Home Page

Input Data

Processed Data
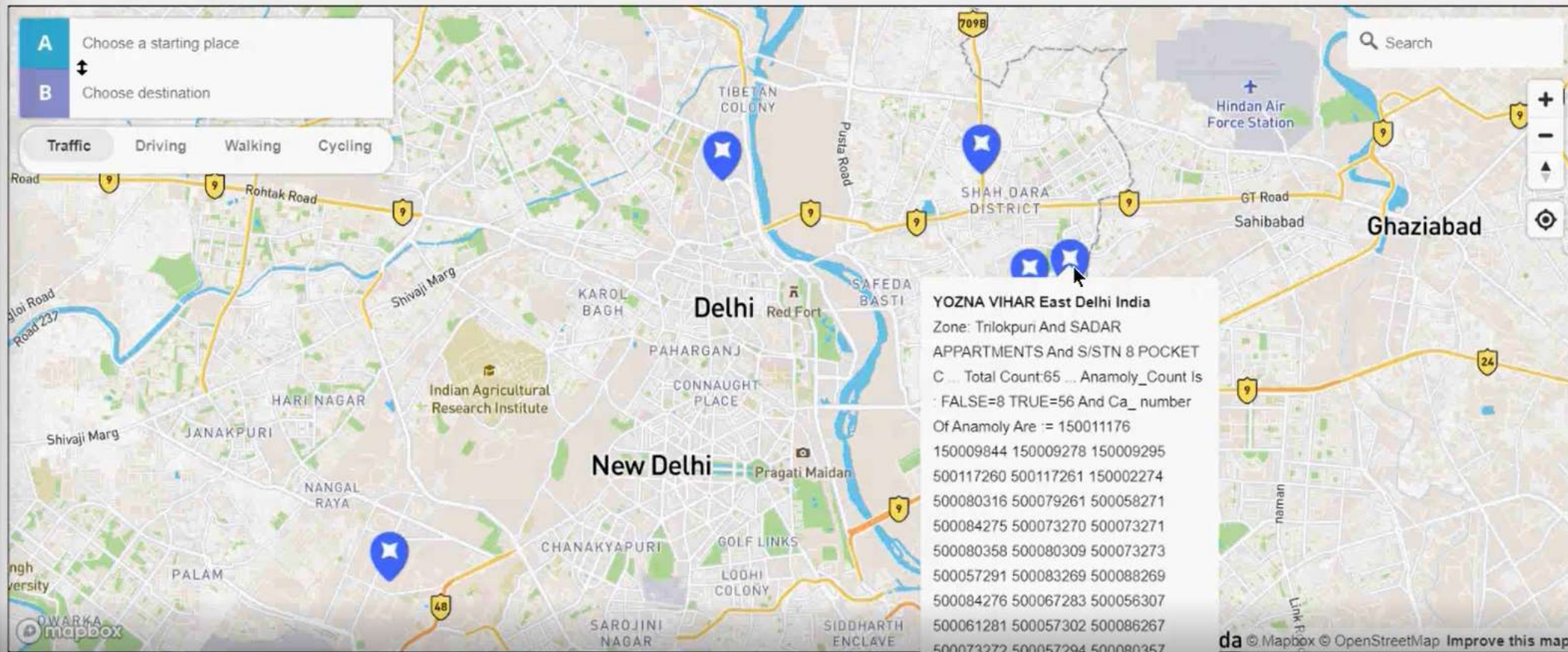
ANOMALY OUTCOME GRAPH

All Records

Loss Minimization

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Driving Operational Efficiencies

BRPL TELEMATICS project
MOBILE & PORTAL TRACKING Application FOR
BRPL Digi Seva Kendra (DSK)

ADDRESSING CHALLENGES

- **PRODUCTIVITY** –HANDLING THE PROCESS
  - MANAGING RESOURCES IN THE FIELD
  - LIVE TRACKING
  - HISTORY TRACKING
  - TIME SPENT AT THE CUSTOMER PREMISES
  - ROUTE TAKEN
- **EFFICIENCY**
  - NUMBER OF ORDERS HANDED IN THE DAY
  - LOCATION VISITED vs TO BE VISITED
- **OPTIMIZATION**
  - TIME SPENT IN THE FIELD
  - DISTANCE TRAVELLED IN THE DAY

Which kind of consumers, field user has to spend more time ......resolve that with FAQ etc

Does travel mode is the only cause for reduced number of customer visited

Understand practical field level difficulties

Verify the expense claims

More enhance ANALYSIS of data for improved productivity

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RESOURCES IN THE FIELD

LIVE TRACKING

HISTORY TRACKING

TIME SPENT AT THE CUSTOMER PREMISES

ROUTE TAKEN

NUMBER OF ORDERS HANDED IN THE DAY

LOCATION VISITED vs TO BE VISITED

TIME SPENT IN THE FIELD

DISTANCE TRAVELLED IN THE DAY

INTEGRATION WITH THE EXISITING DSK APPLICATION

APPLICATION LANDING PAGE
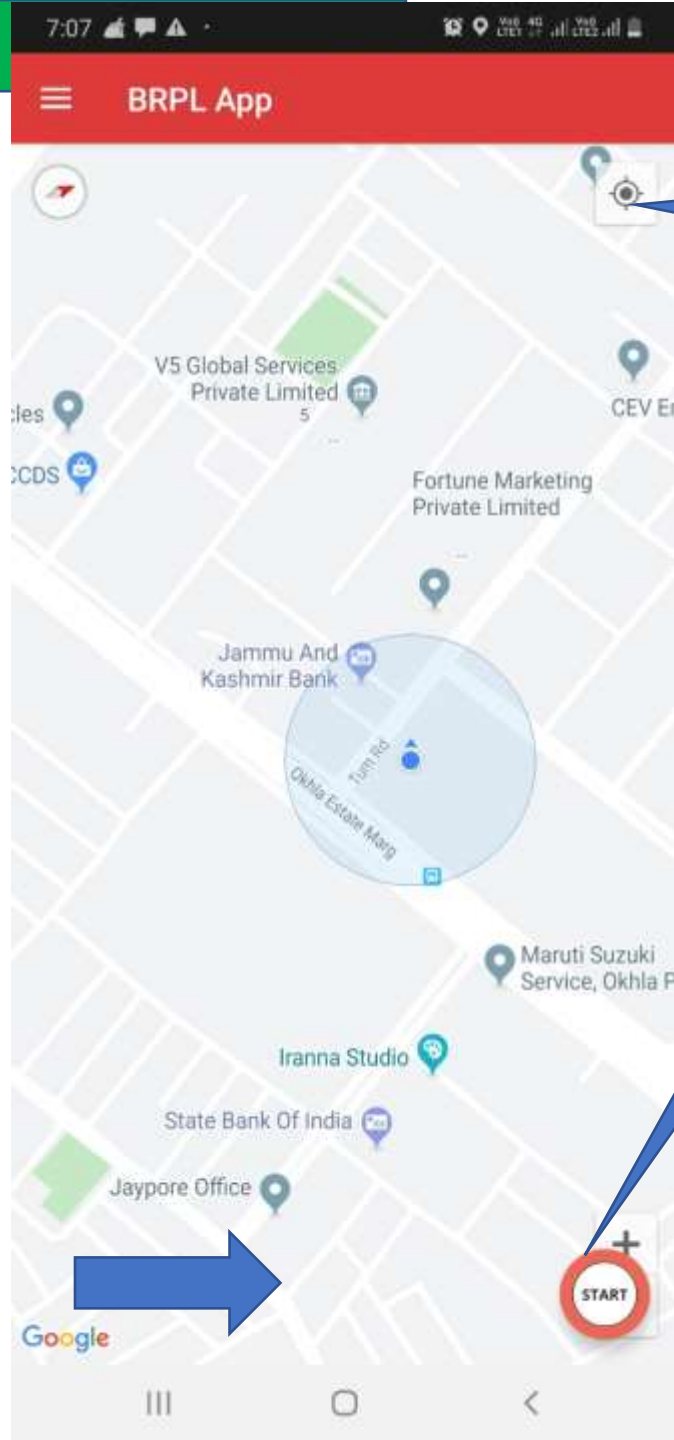
ON TAKING THE PIN, ZOOM TO CURRENT LOCATION

APPLICATION LANDING PAGE Like Ola/UBER

User current position – STARTED or STOPPED
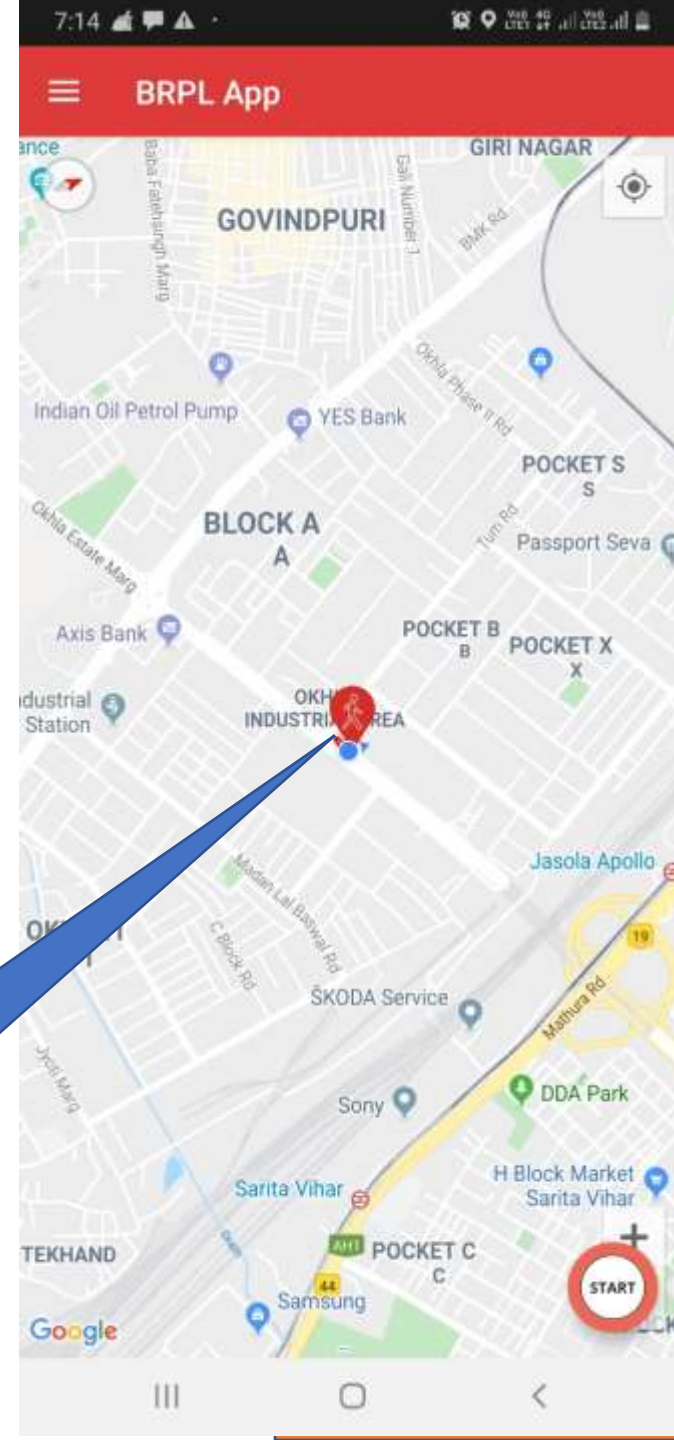
Manager view of all the reportes and their location and their STATUS

7:24

BRPL App

Kyrgyzstan

Tajikistan

Pakistan

Ne

Nepal

India

Bengaluru

Bay of Ben

Sri Lanka

Google

Login

UserName
mgr

Password
12345678

LOGIN

Right click on user and get the viewing option
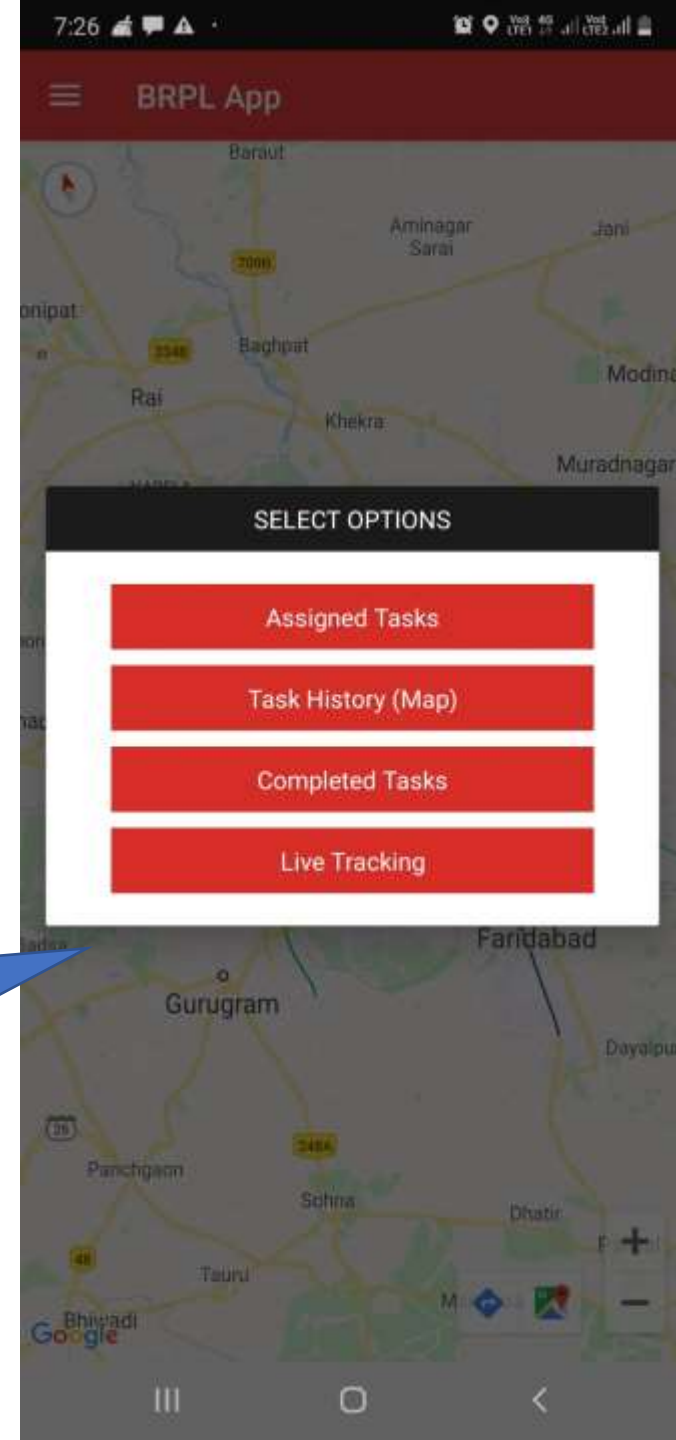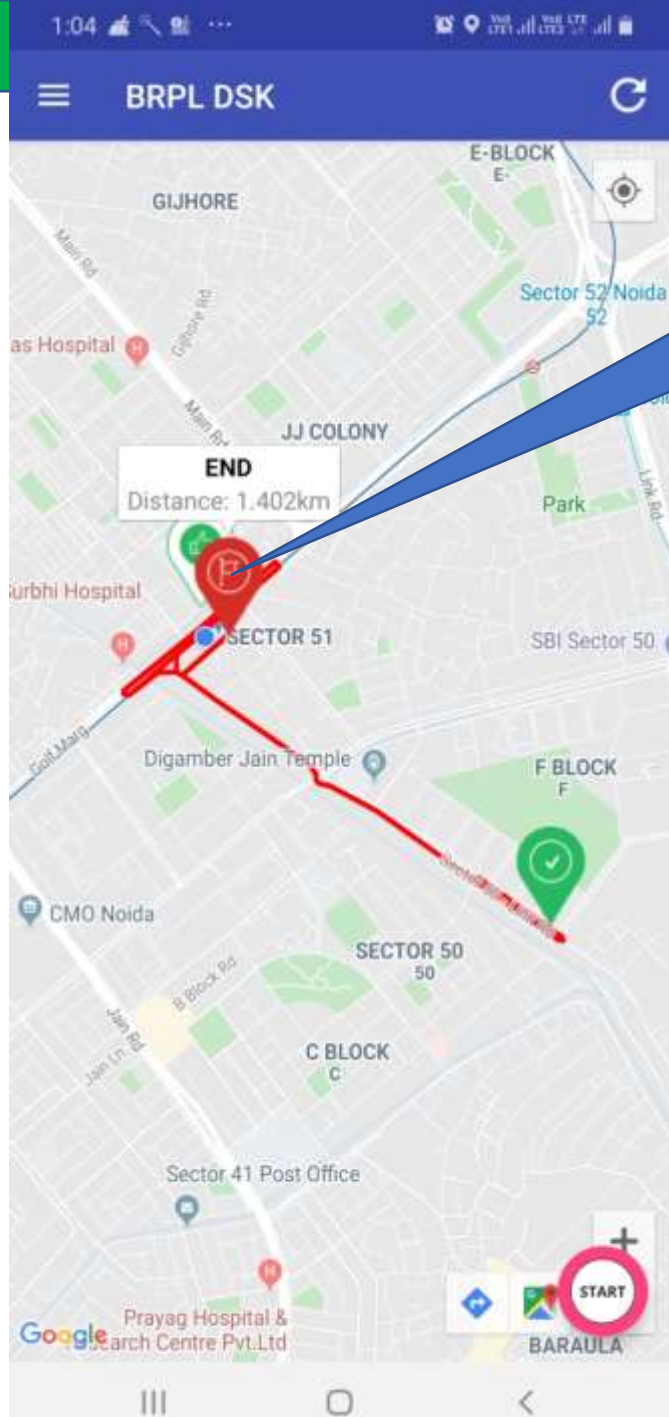
Distance covered by the user in the journey

USER , customer address to be visited and the address as the time of SUBMIT location, with date , time , lat long details
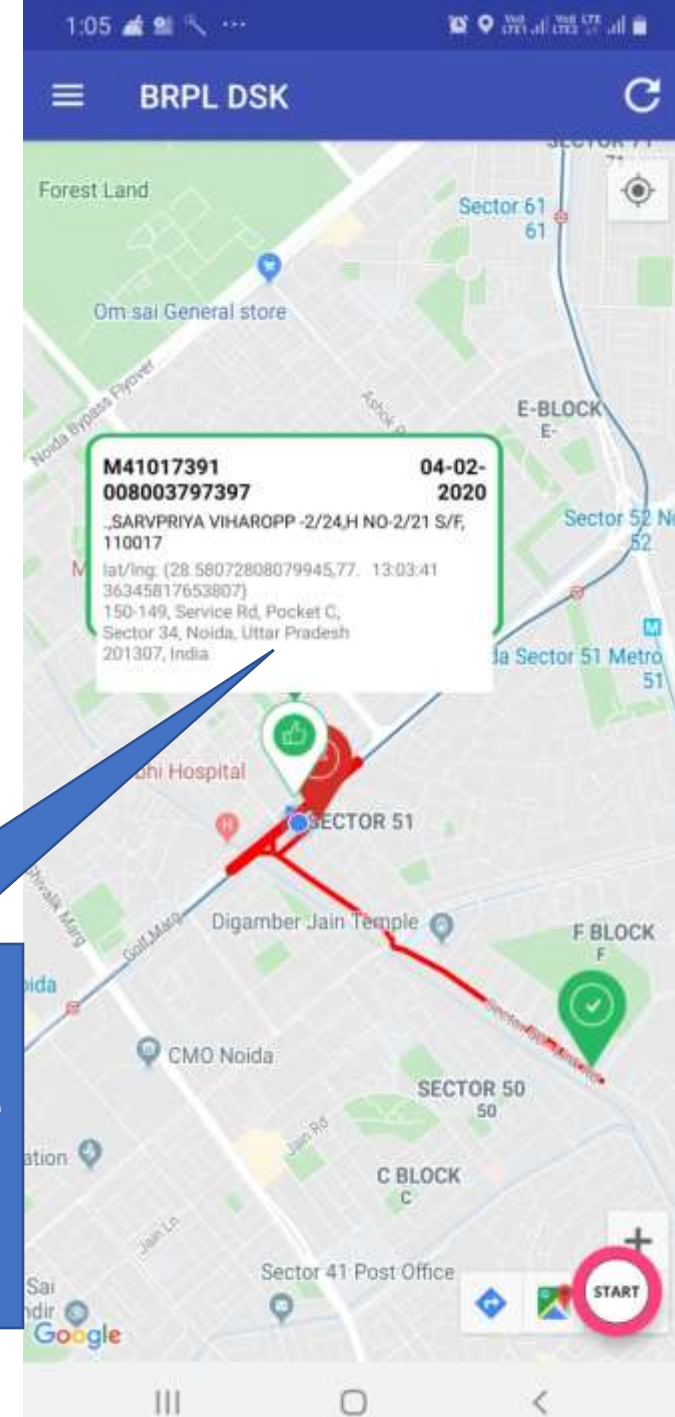
Loss Minimization/Operation Efficiencies

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Driving Operational Efficiencies

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Clk2pay
Hybrid Solution
(Mobile and Portal)

0034608

Is the meter reading?

| YES | NO |

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Saving on the cost of visit, follow up

Background

- Solution to help utilities to enable their customer to click their consumption from the meter and instantly pay the bill, without any human intervention and delay

- The another big advantage of this solution is , it reduced the operation cost of meter reading as it supports , not only the quick billing , but also storing the image for the customer to support and help in future problem resolution of wrong billing

- This solution helps reduce cost associated with each single consumer ie meter reading + uploading the information in central billing system + sending bill to consumer + later payment reminders.

- It is estimated that the cost incurred by utilities from the mete reading capture from consumer premises to the bill being raised and dispatched is in tune of 15 cents per month per consumer
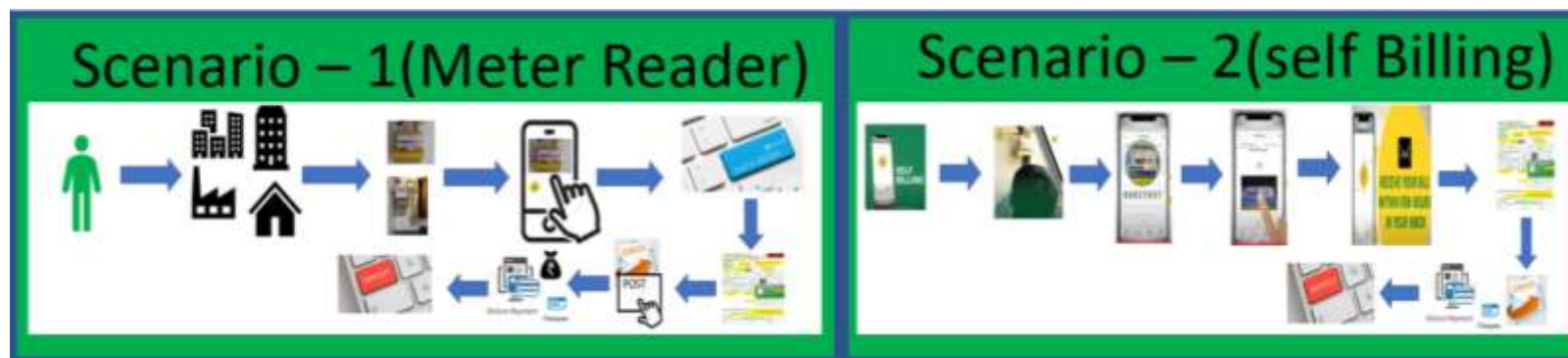
Powered by Artificial Intelligence

Clk2pay

Impact on Operational Savings

EXPRIENCE THE DIFFERENCE

...

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CUSTOMER LANDING PAGE

CUSTOMER METER

FRAMING METER
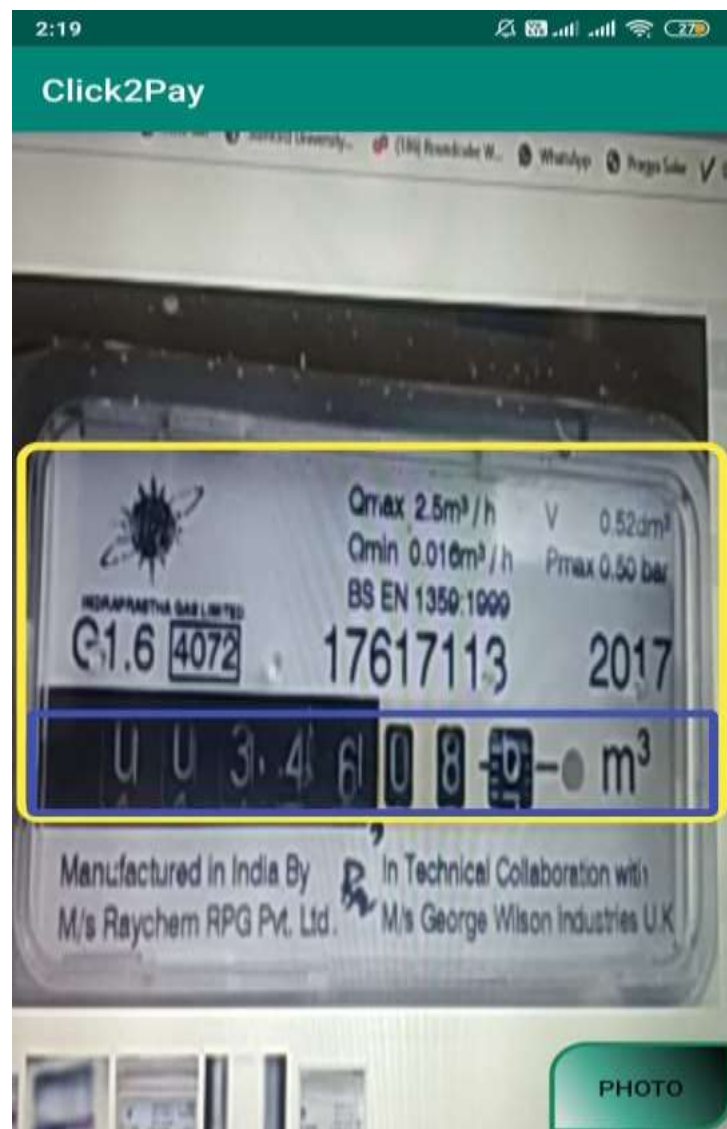
ARTIFICIAL INTELLIGENCE MODELLING

CURRENT METER READING

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Time to output reading is max 30 secs

INSTANT BILLING FOR THE CONSUMER

EXITING THE APP

Click2Pay

Billing Details

Previous Bill Amount		542741
Previous Meter Reading		0034608
Current Meter Reading		0034708
Current Consumption		100
Customer Category tariff	25	
Current Consumption charges		2500
Arrear		
Penalty		
Taxes		450
Due Date		14-09-2020
Total Amount for the month		2950
Total Bill Amount after due date	3000

Invoice Details

Invoice number	15000016255
Invoice Date	30-08-2020
Bill Amount	2950

PAY NOW   PAY LATER

8:22 PM | 0.1KB/s ··

Click2Pay

Address		K-1101 11TH FLOOR TOWER K ARIHANT ARDEN GH07 SECTOR 1 GREATER NOIDA EXTENSION
Mobile No.		8527547612
Email ID		navin.jiit@gmail.com

Account Information

Do you really want to logout?

NO   YES

Meter Number | 17617113

Meter Make | RAYCHEM

Meter Model | BK-G16

Meter Serial no. |

Customer Join Date | 18-05-2020

READING   BILLING
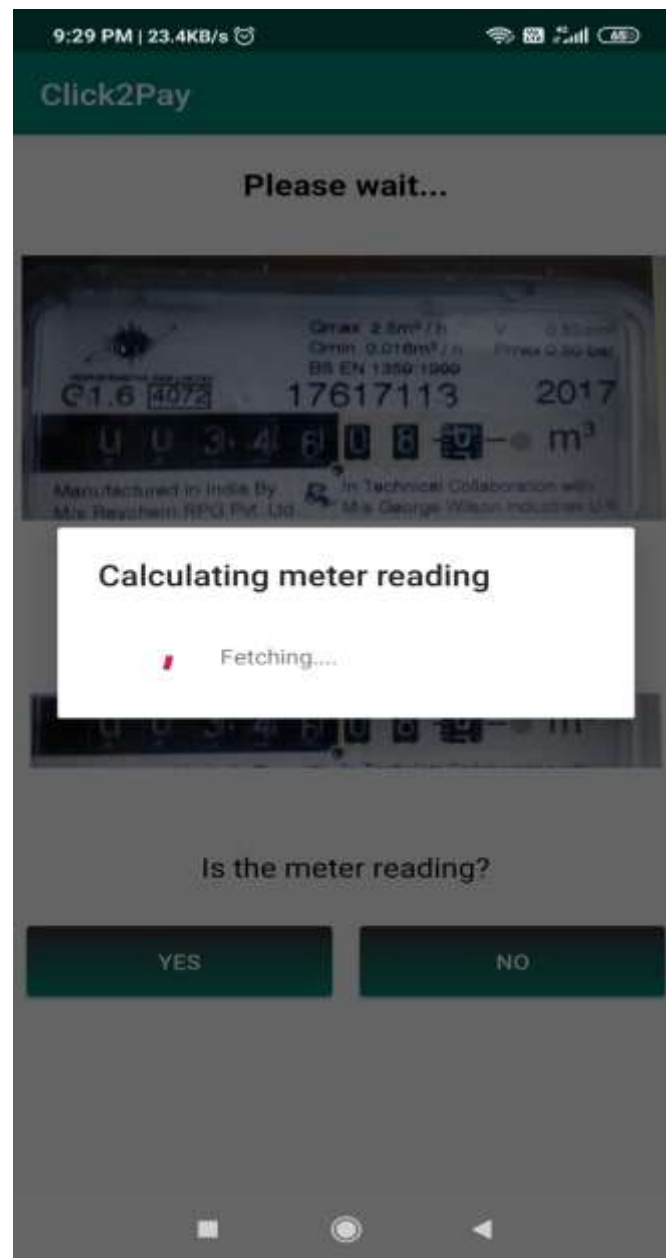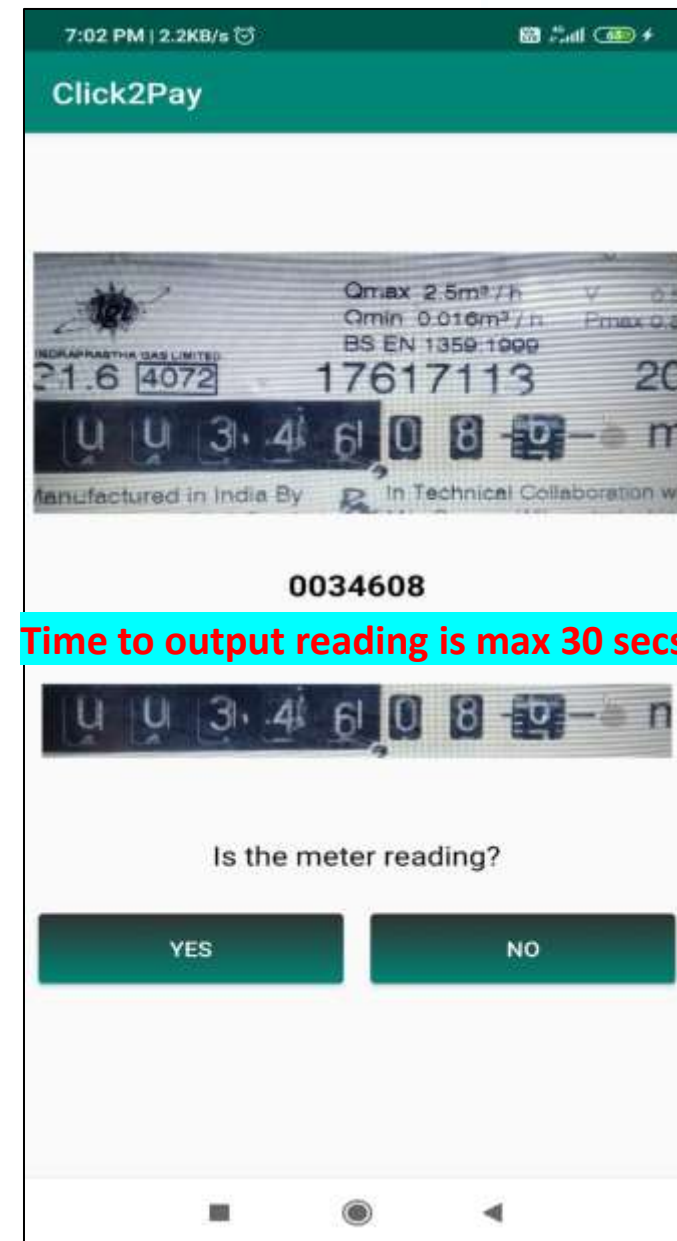
ABOUT APC

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Team Size of 20 people
Order worth 0.50 Million USD

| 5 + PHD | 5 + Data Scientist | 5+ Data Engineers | 5 + MBA |

Capacity Building with ISGF — 2020, Sep

Data Lake Order — 2020, Sep

AI Order — 2020, August

100 + Years Experience

DIPP Registered — 2020, March

NLP Order — 2019, Dec

ML Order — 2019, Sep

| Trained 2000+ Faculty | Trained 1000+ Students | Trained 50+ Corporate |

Capacity Building with NPTI — 2018, Feb till date

Founded — May, 2018

Our Journey so Far

Enablers

Guiding team

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Sumit Gupta

Sumit has been a solution evangelist for Smart Grid, Renewable Energy and Power Management in past. He brings in over 20 years of industry experience spanning over Domain of Energy & Utility, currently provide direction to **assetplus consulting** as **Founder and CEO**, <u>a startup</u>, focusing on strategic decision making support to Utilities .

Sumit has contributed in Capacity as

✓ Program Advisor – Energy Efficiency & Adoption of Renewable Energy, with Ministry of Micro, Small and Medium Enterprise (MSME),
✓ Program Advisor on new initiative ie SOLAR ANALYTICS (Capacity building and Consulting) with National Institute of Solar Energy (NISE), under Ministry of New & Renewable Energy (MNRE),
✓ Program Advisor for Power Analytics initiative in India with National Power Training Institute (NPTI) under Ministry of Power
✓ Advisory committee Guiding International Solar Alliance (ISA), NISE & SECI on adoption of solar (MICRO GRID, Off grid system)at AFRICA

Sumit has been associated with AT Kearney , PricewaterhouseCoopers, SAS, in the past.
- *BE in Material Science and Metallurgy(NIT, Rourkela)*
- *Post Graduation in Supply Chain Management (IMT, Ghaziabad) and*
- *Advanced Management Program in Strategy & Leadership from Harvard University*

CEO & MENTOR

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Prasanna Jha

- Graduate **from IIT Kharagpur in Mechanical Engineering** with more than 15 years of experience in Product Design/Development , Management and Managing technical team. Prassana has been associated with PTC India in the past.
- In 2012, Prasanna has started my entrepreneurial journey by starting JhaMobi which is in mobile application development industry. Starting from market analysis, product planning, requirement gathering and analysis, code development to documentation.
- Has been a serial Entrepreneur start-ups like **Jhamobi & Mansionlee**

Ratna Gupta

- **Ratna** bring in 20 years of diversified experience , worked for a decade in IT industry in Financial domain in technical and functional role
- She moved on to academia with the mission to create young mind focused on developing both professionally and spiritually , a combination which is a foundation for a future leader. She has dedicated a decade in Academia
- **Ratna has been associated with Ramco System, Microsoft, Infosys**
- **BE in Electronics & Communication (BIT , Mesra, Ranchi),**
- **MBA Finance (BIT , Mesra, Ranchi),**
- **Phd in Financial Derivatives (BIT , Mesra, Ranchi),**

LEADERSHIP TEAM

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Navin Kumar

•Head of Analytics with 14+ years of experience in Data Science, Analytics. Helping clients to leverage the power of AI/ML/NLP, Big Data, Cloud and Blockchain in their business to drive the value and streamline the existing processes.

•Helped utility to understand their customer payment behavior and decide the strategy using ML algorithm. Potential value-add in ~5-7 Cr per monthd.

•Helped Taxation department to utilize the analytics to deepen and widen tax base using AI and ML algorithms

•Helped Baking Client to validate their existing transaction fraud models using AL/ML model validation techniques.

•Helped Govt to understand the citizens issues and moods using social media analytics and grievance data.

•Helped Telecom customer to identify the social media influencer model to reduce their camping cost and effectively target the potential brand ambassador.

•Helped KPO customer to reduce the churn of their customers using ML models.

• **Navin has been associated with TCS , SAS & EXL in the past.**

• **He holds B.Tech in Computer science from JIT, Noida**

LEADERSHIP TEAM

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