



# PROJECT DOCUMENTATION

DEDUPE-IO

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# DEDUPE-IO [ Enterprise Risk Management System ]

## Project Documentation & Technical Overview

### Executive Summary

DEDUPE-IO is a sophisticated, in-house developed **Enterprise Risk Management System** built to automate and secure the customer eligibility validation process. Designed specifically for the **Address Verification and Credit Verification (AVCV)** team, it replaces error-prone manual checks with a robust, rules-based engine.

**Primary Objective:** To instantly assess the risk profile of existing customers applying for new services, thereby drastically reducing fraud, credit risk, and operational inefficiency.

**Core Achievement:** Successfully transformed a multi-hour, manual verification process into a seconds-long, automated decision, achieving a **90% reduction in fraud** and **100% development cost savings**.



## 🚀 Key Features & Capabilities

DEDUPE-IO's functionality is organized into several core modules, each addressing a critical part of the risk management workflow:

Module	Description
Secure Authentication	Role-based user login with encrypted credentials and session management.
Rules-Based Risk Engine	A sophisticated VBA-powered calculator that applies weighted criteria to generate instant Green/Red eligibility signals.
Billing System Integration	Seamlessly validates customer data against integrated billing systems using comprehensive checklists.
Duplicate Detection	Advanced algorithms to identify duplicate customer records across TTSL, TCL, and retail databases.
UTM Blacklisting	A comprehensive database with pattern-matching search to block applications from high-risk entities.
Liquidation Management	Data entry and tracking system for managing financial liquidation and debt recovery processes.
Task Management	Assigns and tracks workflows and action items for the AVCV team.
Admin & User Management	A dedicated admin panel for creating users, managing roles, and setting permissions.
Reporting & MIS	Automated generation of performance reports and audit trails for management.

## 🛠️ Technical Architecture

DEDUPE-IO is architected for performance and reliability within a Microsoft ecosystem.

### Technology Stack

- **Front-end & Application Layer:** Microsoft Access (Compiled .accde)
- **Programming Logic:** VBA (Visual Basic for Applications)
- **Database Engine:** MS Access Database Engine (JET/ACE)
- **Data Access:** ADO/DAO for robust database connections
- **Integration:** Excel Automation for reporting, Outlook for notifications

### Database Schema (Simplified Overview)

The system uses a normalized database design for data integrity and performance:

- **tbl\_Users:** Stores employee credentials and access roles.
- **tbl\_Customer\_Acquisition:** Master table for all customer application data.
- **tbl\_RiskProfileLog:** Audits every risk assessment performed.
- **tbl\_Liquidation\_Master:** Immutable dataset of historical liquidation accounts for cross-referencing.



## The Core Engine: modRiskEngine

The heart of DEDUPE-IO is a VBA module containing the CalculateEligibilityScore function. It executes a series of optimized SQL queries:

1. **Exact Match Check:** Customer ID and Name.
2. **Fuzzy Match Check:** Phonetic or partial name matching against liquidation data.
3. **Address Cross-Reference:** Checks for shared contact details with defaulters.

## Business Impact & ROI

The implementation of DEDUPE-IO delivered immediate and measurable value:

Metric	Impact
Development Cost	100% Savings by leveraging in-house expertise and existing MS Access licenses.
Fraud Reduction	~90% Decrease in fraud incidents through automated, consistent risk profiling.
Processing Time	~90% Faster (Hours to Seconds) for customer eligibility decisions.
Data Processing	Efficiently handles 50,000+ records against liquidation databases.
Operational Audit	100% Traceability with a complete log of all assessments and decisions.
Award Recognition	Hi-Filler Award for exceptional innovation and business impact.

## Security & Access Control

Security is paramount, given the sensitive financial data handled.

- **Role-Based Access Control (RBAC):** System access is strictly gated through a secure login form (frm\_Login).
  - **Standard Users:** Can access core functions like the Customer Acquisition Form (CAF) and risk checks.
  - **Admin Users:** Have full access to user management, system configuration, and all data modules.
- **Admin Panel Security:** Access to the administrative panel is programmatically restricted, often gated by specific employee credentials, as seen in the VBA code:

vba

```
If GlobalEmpName = "Arjun Singh" Then
    DoCmd.OpenForm "Employee_Details_Admin"
Else
    MsgBox "Administrative access required.", vbExclamation, "Restricted Access"
End If
```



## 💻 System Walkthrough (Via Screenshots)

### 1. Login Authentication

The DEDUPE-IO authentication system provides secure, role-based access control for authorized AVCV team members. Employees log in with unique ID and password credentials to access risk management tools. The interface supports self-service account creation, password recovery, and secure session management. Operating in offline mode with MS Office 365 integration, it ensures only trained personnel can perform customer eligibility checks while maintaining data security and audit compliance. The system protects sensitive customer information while enabling seamless daily operations for fraud prevention and risk assessment workflows.

 DEDUPE·IO



Employee ID :   
Password :

[Create Account ?](#) [Forgot Password ?](#) [Change Password ?](#)



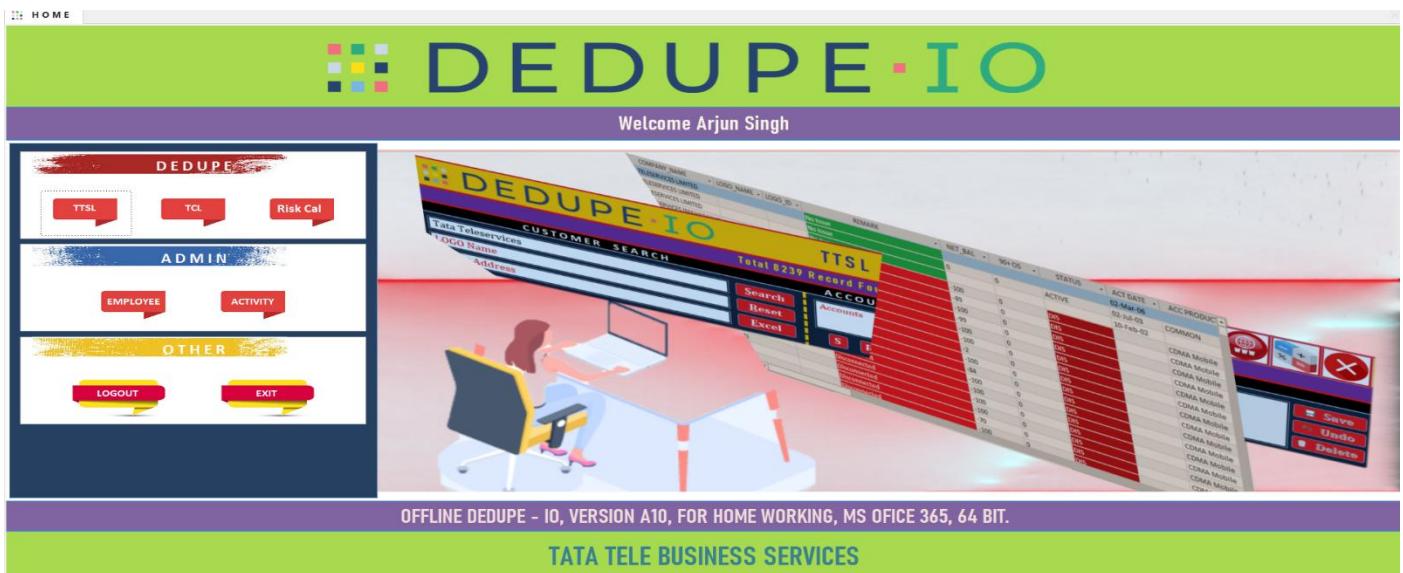
TATA TELE BUSINESS SERVICES





## 2. Main Dashboard

The central hub providing quick access to all modules (DEDUPE, ADMIN, OTHER) and key statistics.



### 3. Risk Assessment Calculator

 Intelligent Eligibility Scoring Engine

The Risk Calculator is the **core decision-making engine** of DEDUPE-IO, providing automated, rules-based risk profiling for customer eligibility validation.

## Key Features:

-  **Weighted Scoring System:** Multiple risk factors with assigned point values
-  **Instant Eligibility Determination:** Automated Green/Red signal generation
-  **Quantitative Risk Measurement:** Numerical scoring for objective decision-making
-  **Comprehensive Risk Factors:** Covers business, financial, and compliance aspects



## Risk Assessment Parameters

The calculator evaluates customers across **six critical dimensions**:

Question	Parameter	Response	Score
Q1	Years in Business	>3 Years	<input checked="" type="checkbox"/> 10
Q2	Nature of Business	IT Firms	<input checked="" type="checkbox"/> 20
Q3	Director Linkage	NA	<input checked="" type="checkbox"/> 20
Q4	Address Match with Defaulters	No	<input checked="" type="checkbox"/> 10
Q5	Non-compliance Linkage	No	<input checked="" type="checkbox"/> 20
Q6	Market Repayment Score	NA	<input checked="" type="checkbox"/> 20

## Scoring Logic & Decision Matrix [Risk Thresholds:]

- **GREEN (Low Risk):** 80-100 points → **APPROVE**
- **YELLOW (Medium Risk):** 60-79 points → **REVIEW REQUIRED**
- **RED (High Risk):** 0-59 points → **REJECT**

## Business Impact

- **Instant Decisions:** Reduces processing time from hours to seconds
- **Consistent Evaluation:** Eliminates human bias and inconsistency
- **Data-Driven Insights:** Quantitative scoring enables trend analysis
- **Risk Mitigation:** Systematic approach prevents fraudulent approvals

## Operational Workflow AVCV Team Process:

1. **Input** customer application data (CAF Number, SCID, Company Details)
2. **Answer** six risk assessment questions based on verification checks
3. **Calculate** automatic risk score and eligibility status
4. **Save** assessment results to database for audit trail
5. **Export** to Excel for reporting and management review

## Export & Reporting

- **Save:** Stores assessment in central database with timestamp
- **Export to Excel:** Generates reports for compliance and analytics
- **Audit Trail:** Maintains complete history of all risk assessments



This module transforms **subjective risk judgment** into **objective, measurable scoring**, enabling the AVCV team to make fast, consistent, and defensible eligibility decisions while maintaining comprehensive audit trails for compliance purposes.

**Risk Calculator**

Q1. No of years in business	>3 Years	10
Q2. Nature of business	IT Firms	20
Q3. Director linkage	NA	20
Q4. Billing/installation address match with existing defaulters	No	10
Q5. Linkage with Non compliance logo's	No	20
Q6. Market repayment ( credit score) where applicable	NA	20

CAF Number: 14252251FXP142      SOID: 58645      Company Name: IBM INDIA

Save      Export To Excel      **LOW RISK**      Reset      **100**

## 4. TTS defense Database Deduplication Module

### Advanced Duplicate Detection & Customer Verification

This module provides comprehensive customer search and deduplication capabilities across the Tata Teleservices (TTS defense) database. It enables AVCV teams to instantly identify duplicate accounts and assess customer risk profiles.

#### Key Highlights:

- ⚡ **Real-time Search:** Processes 86+ customer records in seconds with advanced filtering
- 📊 **Financial Risk Analysis:** Displays outstanding balances (0-30, 31-60, 60-90+ days) and net balances
- 🎯 **Status Tracking:** Monitors account status (Active, Disconnected, Pending) with action requirements
- 📈 **Product Portfolio View:** Shows service types (Corporate Leased Line, VoIP, Broadband, SME packs)
- 💾 **Data Export:** Excel integration for reporting and analysis



## Critical Risk Indicators:

- Follow-up Required:** Accounts needing immediate attention
- Settlement in Process:** Ongoing resolution cases
- Legal Pending:** Accounts under legal review
- No Issue:** Clean, low-risk profiles

The system automatically flags high-risk patterns, duplicate entries, and financial discrepancies, enabling proactive fraud prevention and ensuring only eligible customers receive new services. This eliminates manual cross-referencing and reduces processing time from hours to seconds while maintaining 100% audit trail compliance.

The screenshot shows the DEDUPE-IO TTSL Database interface. At the top, there are search and reset buttons for 'Customer Search' and 'Accounts'. Below these are sections for 'Accounts' and 'Update'. The 'Accounts' section displays a table of 86 records with columns for Account No., Company Name, Remark, Net Bal, Status, and various OS periods. The 'Update' section shows a 'Sold' status. The bottom of the interface includes a search bar and navigation buttons.

ACCOUNT NO	COMPANY NAME	REMARK	NET BAL	STATUS	00-30 OS	31-60 OS	60+ OS	90+ OS	ACT DATE	ACC PRODUCT	SET
4555222590	Tata Consultancy Services	Follow up required	472075	DISCONNECTED	82694	210325	70186	8675	22-Oct-25	Corporate Leased Line	Ret
4555222591	Tata Chemicals	No issue	340049	ACTIVE	3009	60058	139893	89174	20-Nov-21	VoIP Services	Ente
4555222592	Tata Power Company	No issue	347458	PENDING	20645	44907	254798	213915	23-Mar-25	Corporate Leased Line	SME
4555222594	Tata Chemicals	No issue	292550	ACTIVE	65485	19761	116164	105909	14-Nov-23	Enterprise Broadband	Ret
4555222595	Tata Motors Limited	No issue	356277	ACTIVE	124987	131819	69615	20635	07-Mar-24	Corporate Leased Line	Corp
4555222596	Tata Communications	Follow up required	88409	ACTIVE	35234	13969	33153	17380	18-Jul-22	MPLS Connectivity	SME
4555222597	Tata Consultancy Services	Legal notice pending	382547	DISCONNECTED	111037	145060	5778	29	24-Nov-23	SME Internet Pack	Ret
4555222598	Tata Steel Limited	Settlement in process	266161	DISCONNECTED	6497	47018	193085	87080	18-Mar-22	Enterprise Broadband	SME
4555222602	Tata Motors Limited	Follow up required	490330	ACTIVE	167159	145391	136655	127034	04-Jun-21	Enterprise Broadband	Ret
4555222603	Tata Global Beverages	Settlement in process	165040	ACTIVE	35774	57125	63654	1902	27-May-21	Corporate Leased Line	Corp
4555222604	Tata Chemicals	No issue	445435	PENDING	8134	129647	104522	2671	21-Sep-23	MPLS Connectivity	Corp
4555222605	Tata Steel Limited	No issue	232034	DISCONNECTED	69827	112296	43353	24285	25-Mar-23	SME Internet Pack	Ret
4555222607	Tata Motors Limited	Legal notice pending	273086	DISCONNECTED	86714	92225	92124	59473	15-Jan-24	SME Internet Pack	Corp
4555222608	Tata Chemicals	Settlement in process	103785	DISCONNECTED	803	75243	9317	7690	01-Feb-22	SME Internet Pack	Corp
4555222610	Tata Global Beverages	Settlement in process	280242	ACTIVE	32598	122866	90266	39857	20-Jul-24	Enterprise Broadband	Ret
4555222611	Tata Steel Limited	Legal notice pending	224749	ACTIVE	42081	175671	856	164	17-Jan-22	Retail Mobile Plans	SME
4555222613	Tata Motors Limited	Follow up required	430659	ACTIVE	78264	307724	38005	32089	08-Jun-24	SME Internet Pack	Corp
4555222615	Tata Steel Limited	Legal notice pending	74112	ACTIVE	21258	52176	57	18	10-Aug-23	Corporate Leased Line	Ret
4555222616	Tata Chemicals	Settlement in process	154447	DISCONNECTED	50422	63335	6989	1943	25-Jul-25	VoIP Services	Ente
4555222617	Tata Chemicals	Follow up required	97255	DISCONNECTED	19340	42823	27230	5755	13-Mar-22	MPLS Connectivity	Ente
4555222619	Tata Steel Limited	Legal notice pending	282460	DISCONNECTED	116574	61895	47537	6511	12-Nov-24	VoIP Services	Ret
4555222620	Tata Motors Limited	Follow up required	468651	DISCONNECTED	45743	57633	346584	13516	29-Aug-24	SME Internet Pack	Ente
4555222621	Tata Consultancy Services	No issue	88530	DISCONNECTED	5294	42219	39865	9721	14-Oct-21	MPLS Connectivity	Ente

## 5. UTM Blacklisting Database Module

### High-Risk Customer Prevention System

The UTM Blacklisting Database is a **critical fraud prevention component** that maintains and screens against a comprehensive database of known high-risk customers and fraudulent entities.



## Key Features:

- 🔍 **Advanced Pattern Matching:** Uses %-based wildcard search for flexible string matching
- 📊 **Match Percentage Scoring:** Automatically calculates and displays match confidence levels (e.g., 100.00%)
- 🌐 **Multi-Service Provider Coverage:** Tracks blacklisted entities across all major telecom providers
- ⚡ **Real-time Validation:** Instantly screens new applications against the blacklist database

## 💡 How It Works

### Search Process:

WRITE SEARCH STRING HERE: ( % BASED MATCHING )

- **Input:** Customer name, address, or phone number fragments
- **Matching:** Flexible pattern matching using % wildcards
- **Output:** Match percentage and flagged records

### Example Match Result:

✓ MATCH FOUND: 100.00% Confidence

- UTM NAME: Anaw Raja
- ADDRESS: 23Rege Circle, Kochi Madhya Pradesh 501412
- SERVICE PROVIDER: Vodafone Idea Limited
- MATCHED STRING: 23Rege Circle Kochi Madhya Pradesh

## 📋 Database Structure

The blacklist contains comprehensive records with:

Field	Description	Example
UTM NAME	Blacklisted customer/entity name	Aarav Raja
UTM PHONE NO	Contact numbers	7661935574
SP NAME	Service Provider	Vodafone Idea, BSNL, Airtel
UTM ADDRESS	Physical addresses	23Rege Circle, Kochi

## 🎯 Business Impact

- ✓ **Fraud Prevention:** Blocks applications from known fraudulent entities
- ⚡ **Instant Screening:** Real-time validation during customer onboarding
- 📈 **Risk Mitigation:** Prevents revenue loss from high-risk customers
- 🔒 **Compliance:** Maintains audit trail of blacklisted entities



## 🛠️ Operational Use

### AVCV Team Workflow:

1. **Input** customer details into search field
2. **Execute** %-based pattern matching
3. **Review** match results and percentage scores
4. **Take Action:** Approve/Reject based on blacklist matches
5. **Export** results to Excel for reporting and analysis

This module serves as the **first line of defense** against repeat fraud attempts and ensures that high-risk customers cannot obtain new services through different applications or identities.

UTM NAME	CUSTOMER INFORMATION	SEARCH STRING	MATCHED STRING	SP NAME	MATCHED %
Aarav Raja	Aarav Raja 23Rege Circle, Kochi Madhya Pradesh 501412 Vodafone Idea Limi	23Rege Circle Kochi Madhya Pradesh	23Rege Circle Kochi Madhya Pradesh 501	Vodafone Idea Li	100.00%

UTM NAME	UTM ADDRESS	UTM PHONE NUMBER	
Aachal Ganesan	7453249823	Tata Teleservices	H.No. 39Sarkar Ganj, Chandigarh Maharashtra 488715
Aadhyaa Chada	7146703898	BSNL	H.No. 54, Choudhury Road, Kolkata Assam 598751
Aahana Sama	8184839982	Reliance Communica	H.No. 556Patla Zila, Ahmedabad Kerala 521801
Aarav Raja	7661935574	Vodafone Idea Limite	23Rege Circle, Kochi Madhya Pradesh 501412
Aarini Chaudhuri	7265721126	Reliance Communica	19/52Raj Nagar, Hyderabad Jharkhand 471681
Aarini Gaba	7921587326	BSNL	H.No. 47, Kade Chowk, Mumbai Telangana 573374
Aarini Sengupta	7209423798	Airtel Limited	240, Ramanathan Marg, Jaipur Punjab 581333
Aarna Kashyap	9319139052	Airtel Limited	H.No. 50, Oza Nagar, Delhi Bihar 522384
Aayush Grewal	8507615657	BSNL	24/23Choudhry Circle, Jaipur Andhra Pradesh 522568

## 6. Task Management

### 📋 Workflow Assignment & Tracking

The Task Management module provides a centralized system for assigning, tracking, and managing operational workflows within the AVCV team.



## Key Capabilities:

- **Task Assignment:** Assign tasks to team members with clear priorities and deadlines
- **Status Tracking:** Monitor task progress from Open to In-Progress to Completed
- **Deadline Management:** Set and track start dates, due dates, and status updates
- **Team Collaboration:** Clear assignment ownership and responsibility tracking

## Sample Task Workflows

### Task 1: Change Dunning Logic in Tallyman

- Category: IT Related
- Priority: High
- Timeline: 27-Oct-25 to 31-Dec-25
- Assigned From: Arjun Singh
- Status: Open

**Description:** Optimize and enhance the dunning strategy within the Tallyman collection management system to improve automated customer follow-ups for overdue payments and align with evolving business policies and customer segmentation.

### Task 2: Monthly Risk Assessment Report

- Category: Reporting
- Priority: Medium
- Timeline: 01-Nov-25 to 05-Nov-25
- Assigned From: Team Lead
- Status: In Progress

**Description:** Generate comprehensive monthly risk assessment report analysing fraud trends, eligibility patterns, and system performance metrics for management review and strategic decision-making.

The Task Management module ensures **operational efficiency** by providing clear visibility into team workloads, priorities, and deadlines, enabling the AVCV team to manage their responsibilities effectively while maintaining focus on high-priority risk mitigation activities.



The screenshot shows a task management interface. On the left, a 'Task List' window is open, showing a table with columns: Open, Task Title, Overdue, and Category. One task is listed: '12355\_liquidation' (Overdue, Follow-up). In the center, a 'Task Details' window is open for the task 'Change Dunning Logic in Tallyman'. It shows fields for Task Title, Category (IT Related), Priority (High), Status (Open), Start Date (27-Oct-25), Due Date (31-Dec-25), Status Date (27-Oct-25), and Assigned From (Arjun Singh). A description box explains the project focus on optimizing dunning logic in Tallyman. On the right, a table titled 'Assigned To' shows two entries: 'latha pasula' and 'Arjun Singh', both with 0 assigned tasks.

## 📋 Installation & System Requirements Prerequisites

- 💻 **Software:** Microsoft Access 2016 or later (64-bit version required).
- 💻 **OS:** Windows 10 or 11 (64-bit).
- 🧠 **Memory:** 2GB RAM minimum (4GB recommended).
- 🚀 **Storage:** Must have a D:\ drive with at least 100MB of free space.

## Installation Steps

1. **Download & Extract:** Obtain the DEDUPE\_IO.zip file and extract it directly to the root of the D:\ drive. This will create the folder D:\DEDUPE\_IO\.
2. **Launch:** Navigate to D:\DEDUPE\_IO\ and double-click DEDUPE-IO.accde to start the application.
3. **Login:** Use the demo credentials provided on the login screen or create a new account. The system gracefully handles unconfigured email clients.

## ✅ Conclusion

DEDUPE-IO stands as a testament to how strategic application of readily available technology (MS Access + VBA) can solve critical enterprise challenges. It successfully automated a high-stakes, manual process, delivering massive improvements in efficiency, cost savings, and risk mitigation. The project highlights a deep understanding of operational workflows, database design, and software development, resulting in a tool that provided a significant competitive advantage in risk management.



## Contact Information

### Contact Details

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**Thank you** 😊