

## Stephen Dornu Dugbartey

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### Project: Database Access Control Audit

#### 1.0 Background

Every modern organisation segregates duties performed by roles within a defined process. Segregation of duties ensures accountability and reporting that promotes good corporate governance. The duties performed by each role are predefined with assigned authority and access privileges. Continuous monitoring and audit are required to keep the assigned authority in check and the privileges within allowed limits.

#### Objective:

The objective of this project is to determine existence and strength of controls to access, update and deletion of a bank loan customer database by officers of the loan department. It is expected that most of the Personally Identifiable Information (PII) of the customers which form this database should be relatively permanent and highly confidential. Any user requires appropriate access and the required permission to update or delete with supporting documents.

#### Scope and Information Classification:

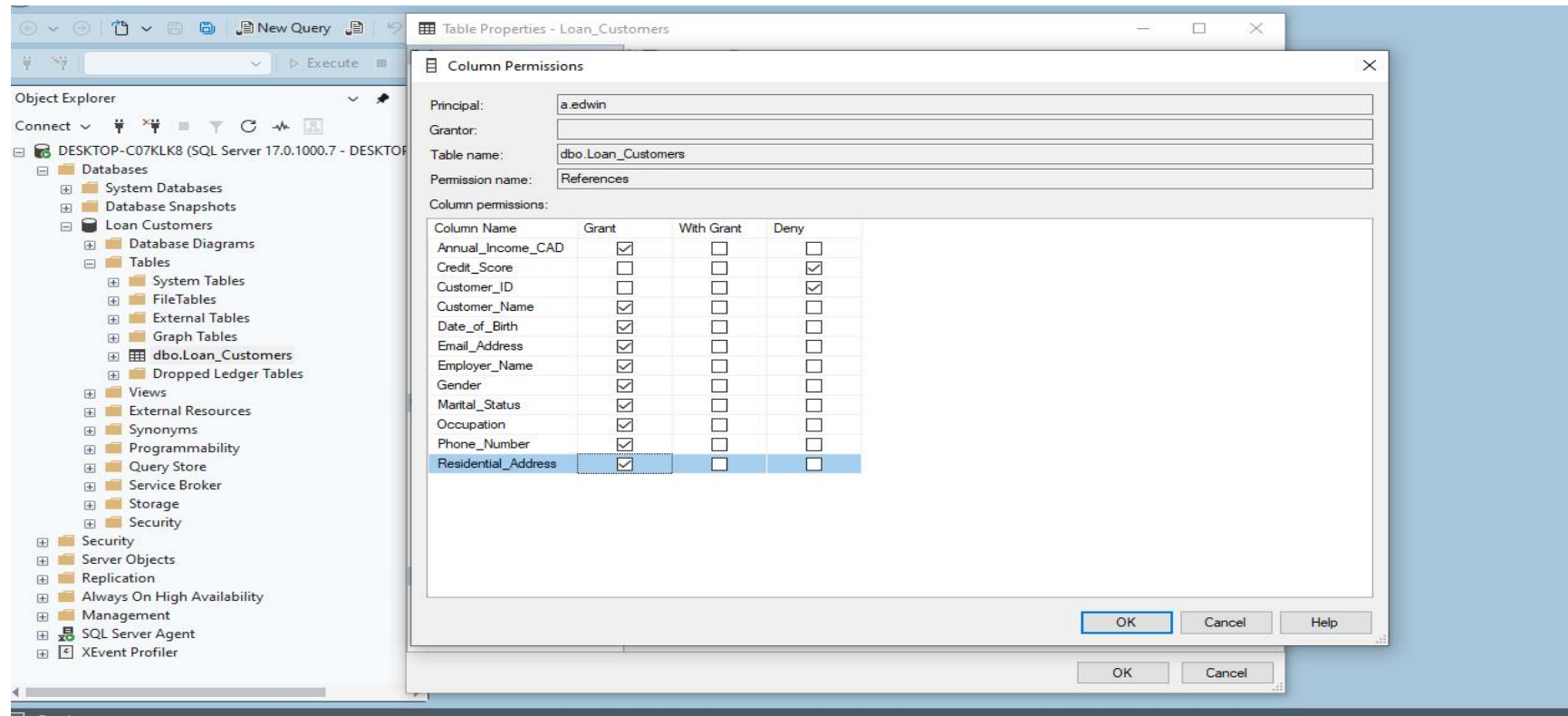
62 loan customers were used for this project. Their information is classified as below. The classification groups are: Internal, Confidential, or Highly Confidential

Information Type	Classification	Amendment Permission
Customer ID	Internal	No
Customer name	Confidential	Yes
Gender	Internal	Yes
Marital Status	Internal	Yes
Residential address	Confidential	Yes
Phone number	Confidential	Yes
Email address	Confidential	Yes
Annual income	Highly Confidential	Yes
Employer	Highly Confidential	Yes
Credit score	Highly Confidential	No

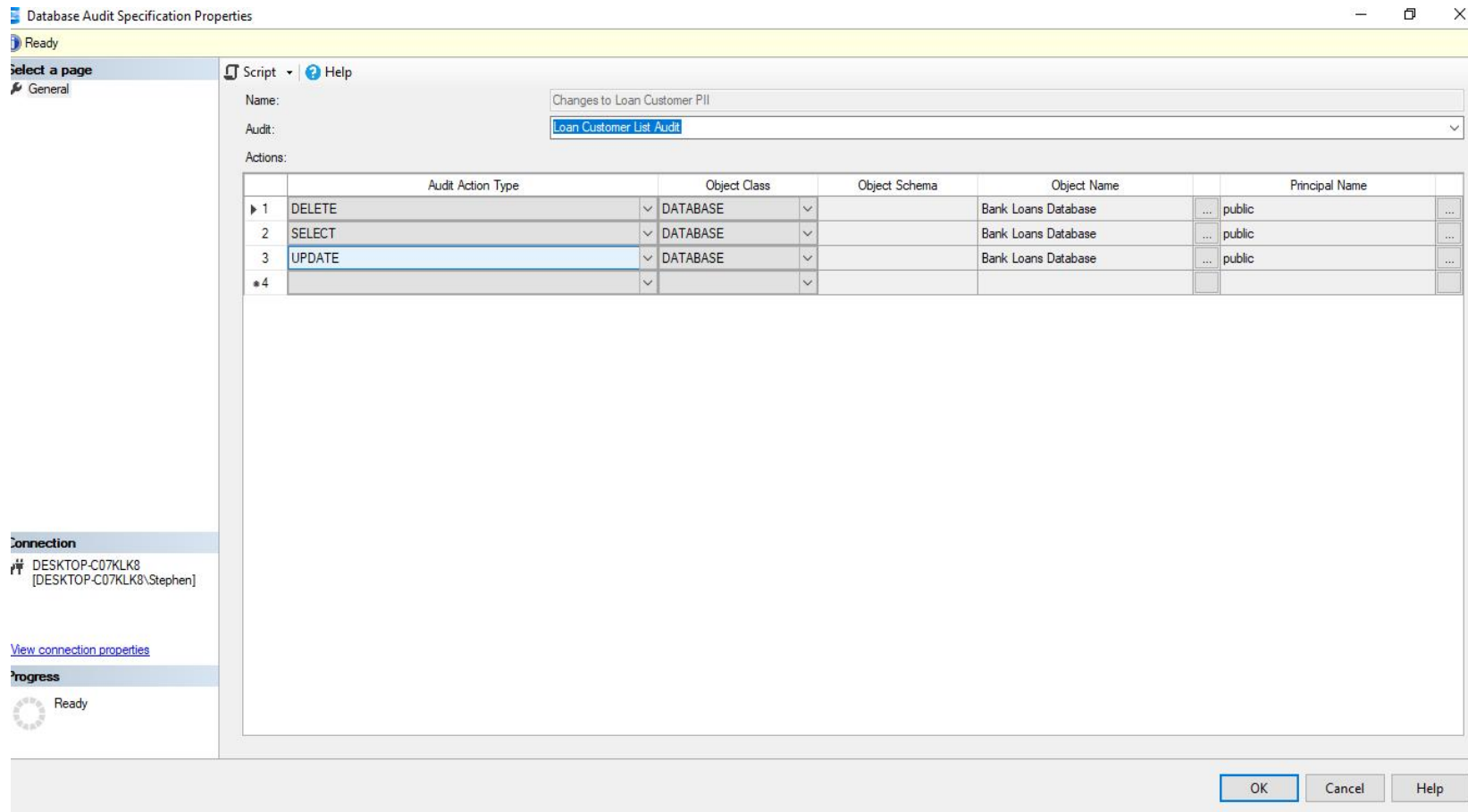
## Methodology:

The following methods were deployed:

- Acquired sample datasets relating to 62 bank loan customers with their personal identifiable information (PII). *The PII of the loan includes information relating to their: Customer ID, Customer name, Gender, Marital Status, Residential address, Phone number, Email address, Annual income, Employer, Credit score.*
- The SQL Server Standard Development option was downloaded and installed together with the SQL Server Management Studio (SSMS).
- The **Loan Customer** database was created in SSMS and the bank loan customer list was uploaded.
- An identity and access login was created for *a.edwin* with appropriate permission as an inputer per the loan process cycle. A screenshot is captured below:



- The audit and the server audit specification were created for the loan customer database with required audit action type in the SSMS



- The user **a.edwin** was allowed to perform some activities on the Loan Customer List

The screenshot shows the SQL Server Enterprise Manager interface. The Object Explorer on the left shows the 'Bank Loans Database' selected. The central pane displays a SQL query titled 'SQLQuery1.s...ephen (51))' with the following code:

```

1  select * from dbo.[Loan Customer List]
2
3  update dbo.[Loan Customer List]
4  set Customer_ID = 1000
5  where Customer_ID = 1001;
6
7  select * from dbo.[Loan Customer List]
8
9  delete from dbo.[Loan Customer List] where Customer_ID = 1000;
10
11 select * from dbo.[Loan Customer List]
12

```

The bottom pane shows the 'Results' tab with a table of 10 rows and 10 columns. The first 9 rows are visible, showing customer data. The 10th row is partially visible, showing Customer\_ID 1002 and Customer\_Name Robert Sinclair.

	Customer_ID	Customer_Name	Date_of_Birth	Gender	Marital_Status	Residential_Address	Phone_Number	Email_Address	Annual_Income_CA
1	1002	Robert Sinclair	2002-06-04	Female	Divorced	763 Main St, Laval, QC	747-555-1613	robert.sinclair88@email.com	46456
2	1003	Kevin Park	1990-05-30	Male	Single	329 Main St, Toronto, ON	705-555-3326	kevin.park3@email.com	97982
3	1004	Jean Tremblay	1999-09-11	Female	Divorced	961 Main St, Surrey, BC	710-555-6839	jean.tremblay58@email.com	68207
4	1005	Victor Ivanov	1998-01-02	Male	Single	392 Main St, Red Deer, AB	748-555-1390	victor.ivanov80@email.com	63664
5	1006	Priya Patel	2011-08-18	Male	Divorced	650 Main St, Brampton, ON	454-555-8890	priya.patel87@email.com	99000
6	1007	Grace O'Neill	2018-09-19	Male	Divorced	659 Main St, Montreal, QC	571-555-7072	grace.o'neill73@email.com	68828
7	1008	Lucas Martin	1993-01-03	Female	Single	216 Main St, Laval, QC	406-555-4361	lucas.martin92@email.com	52230
8	1009	Noah Peterson	2012-10-28	Male	Divorced	480 Main St, Laval, QC	518-555-5175	noah.peterson46@email.com	115697
9	1002	Robert Sinclair	2002-06-04	Female	Divorced	763 Main St, Laval, QC	747-555-1613	robert.sinclair88@email.com	46456
10	1002	Robert Sinclair	2002-06-04	Female	Divorced	763 Main St, Laval, QC	747-555-1613	robert.sinclair88@email.com	46456

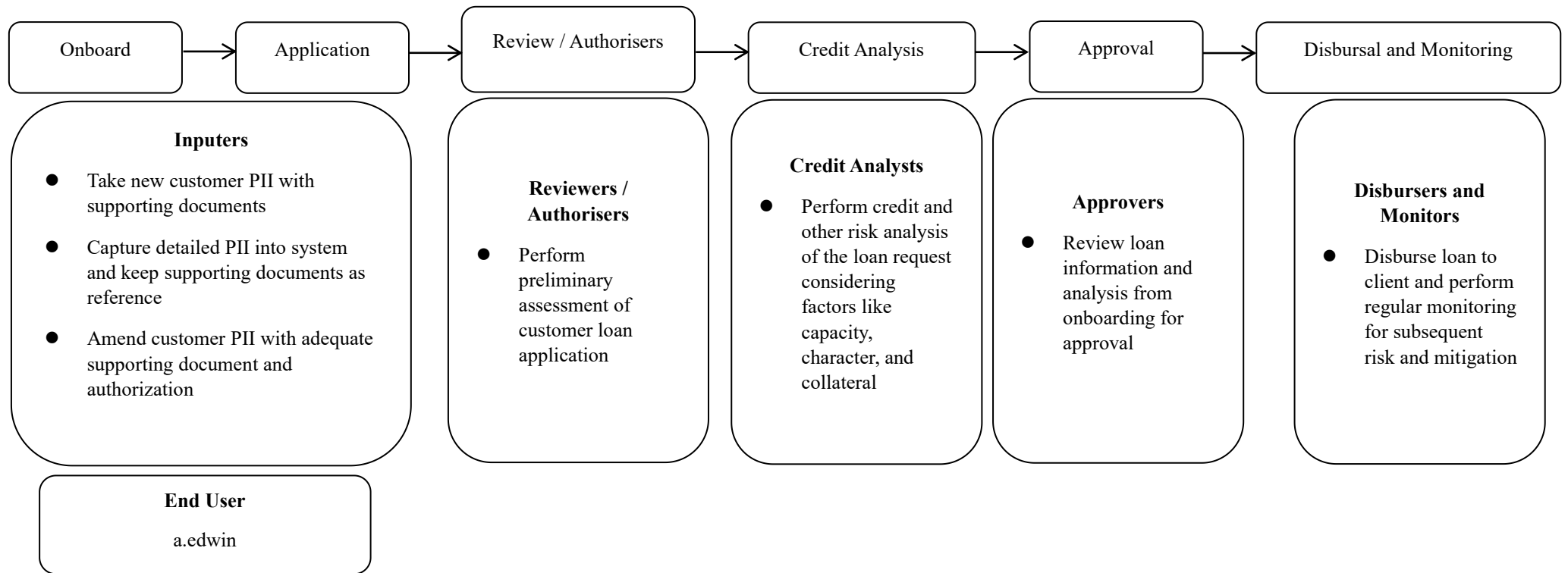
The status bar at the bottom indicates 'Query executed successfully.' and 'Row: 1, Col: 1 | 183 rows'.

- The activities of the user *a.edwin* was audited over the the “Loan Customers List” to determine appropriate access, update or deletion.

[illegible]

## 2.0 Loan Process and End Users

The loan process cycle is broken into six (6) stages as illustrated below and supported by the function of five (5) end users.



### 3.0 Audit Outcomes

The user ***a.edwin*** was able to perform all three actions even though the granted access does not permit the user to either update or delete any customer information on the Loan Customer database. The capability of users performing all restricted actions even though there is adequate and detailed audit log records shows weak database access controls and introduces high access risks. The risk exposure should be assessed immediately with appropriate primary or supplementary controls put in place.

Action	Action Success	Action Permission	Recommended Controls based on NIST CSF 2.0
Select	Yes	Yes	GV.RM: Risk Management Strategy GV.RR: Roles, Responsibilities and Authorities GV.PO: Policy ID.RA: Risk Assessment ID.IM: Improvement PR.AA: Identity Management, Authentication and Access Control PR.AT: Awareness and Training PR.DS: Data Security PR.PS: Platform Security
Update	Yes	No	
Delete	Yes	No	