

K2A Fleets and Machineries Inc. Case Study

Background Information

Due to the exponential growth rate in equipment sales in 2016, and the expansion of the K2A sales beyond North America, K2A Fleets and Machineries Company decided to procure a new S&M Software to manage expected sales transactions.

Protection of transactional data, operational and sales strategies, product and customer information place K2A as the leader in the North America Fleets industry.

As a result of aggressive marketing, discounting and other incentive of head- to-head by the competitors (Eko Fleets Inc., Glover Equipment, Epetedo Engineering and Ebute-Metta Motors) positioned K2A to strictly protect her data from non- management employees and consultants.

S&M Software needs to be tested with data before the deployment into the production environment.

You are hired as a SQL Developer to produce all the deliverables required by S&M Software implementation team.

Note: The deliverables MUST be implemented using SQL Server Database and T-SQL only.

Data Information

S&M software requires normalized four tables (Float Category, Equipment, Customer and Equipment Transaction).

Referential data integrity is maintained on the tables to provide accurate and precise testing data set that mimic K2A live dataset.

Below are the data and tables information:

- a. **Float category** - This contains hidden discounted percent applies to customer apart from the displayed discount. This is based on the equipment category and business rules defined below.

----Float Category Table----

FloatCategoryID **int**
FloatRate **float**
FloatExceedQty **float**
FloatExceedRate **float**

---Float Category data---

1,0.4,15,0.7
2,0.1,15,0.6
3,0.2,50,0.75

4,0.24,68,0.9
5,0.12,100,1.8

- b. **Equipment information-** This contains information about equipment with associated discount percent and float category. There is one to many relationships between float category and equipment.

----Equipment table----

- EquipmentID **int**
- EquipmentName **varchar**(255)
- UnitPrice **decimal** (12,2)
- DiscountPercent **float**,
- FloatCategoryID **int**

----Equipment Data----

1,	' Cup -Lock System of Shuttering – 3.2 M high',	122.50,0.015,1
2,	'Steel Props – 4.2 M High',	100,0.02,1
3,	'Steel shuttering plates – 3 ft x 2 ft',	1000.50,0.05,1
4,	'Steel section Girders – 8ft to 12 ft',	1700.00,0.01,1
5,	'Steel pipes for scaffolding',	15000.00,0.08,1
6,	'Telescopic Girders',	200,0.4,1
7,	'Tower Crane',	233,0.14,1
8,	'Tractor mounted Crane'	,105,0.4,1
9,	'Concrete batching plant',	1325.70,0.015,1
10,	'Mobile batching plant'	,99.87,0.011,1
11,	'Concrete Pump (Greaves – 40 cum/hr)',	1500.50,0.095,1
12,	'Tremix machine set with trowel & floater',	700.69,0.15,1
13,	'Concrete mixers',	120,0.15,1
14,	'D.G. Set – 82.KVA',	12.50,0.15,1
15,	'Vibrators (Electrical)',	200.99,0.001,1
16,	'Vibrators (Petrol)',	4100.90,0.03,1
17,	'Stone cutting machine (Platform type)',	1200.56,0.09,1
18,	'Stone cutting machine (hand type)'	,1780,0.0094,1
19,	'Groove cutting machine',	122.50,0.5,1
20,	'Builder'sÂ Hoist with winch',	122.50,0.5,1
21,	'Bar Bending & cutting machine',	122.50,0.5,1
22,	'Truck'	,122.50,0.5,1
23,	'Air Compressor',	122.50,0.5,1
24,	'Road Roller',	122.50,0.5,1
25,	'Vibro-Roller',	122.50,0.5,1
26,	'Tipper – Tata'	,122.50,0.5,1
27,	'Excavator – ACE'	,122.50,0.5,1
28,	'Tractor with trolly – 40 HP',	122.50,0.5,1
29,	'Water pump',	122.50,0.5,1
30,	'Cutter Hitachi – Model CM 45',	122.50,0.5,1
31,	'Welding Set – Aircooled',	122.50,0.5,1
32,	'Drilling Machine Bosch – GSB – 16'	,122.50,0.5,1
33,	'Mud pump – GEC – 1 HP 2 HP',	122.50,0.5,1

34,	'Floor Grinding machine – 2 HP'	122.50,0.5,1
35,	'Earth Compactor – 7.5 HP motor'	122.50,0.5,1
36,	'CGI Sheets – 10', 12' Long'	,122.50,0.5,1

- c. **Customer Information:** This contains relevant information about the customers includes the postal code and agreed payment days for every purchased equipment.

--- Customer table-----

CustomerID **int**
 CustomerName **varchar**(255)
 Category **varchar**(255)
 PrimaryContact **varchar**(255)
 ReferenceNo **varchar**(255)
 PaymentDays **int**
 PostalCode **int**

--- Customer Data ----

1,	'A Datum Corporation'	'Novelty Goods Supplier'	'Reio Kabin'	'AA20384'	14,46077
2,	'Woodgrove Bank'	'Financial Services Supplier'	'Hubert Helms'	'28034202'	7,94101
3,	'Consolidated Messenger'	'Courier'	'Kerstin Parn'	'209340283'	30,94101
4,	'Litware Inc.'	'Packaging Supplier'	'Elias Myllari'	'BC0280982'	30,95245
5,	'Humongous Insurance'	'Insurance Services Supplier'	'Madelaine Cartier'	'82420938'	14,37770
6,	'Graphic Design Institute'	'Novelty Goods Supplier'	'Penny Buck'	'8803922'	14,64847
7,	'Fabrikam Inc.'	'Clothing Supplier'	'Bill Lawson'	'293092'	30,40351
8,	'The Phone Company'	'Novelty Goods Supplier'	'Hai Dam'	'237408032'	30,56732
9,	'Trey Research'	'Marketing Services Supplier'	'Donald Jones'	'82304822'	7,57543
10,	'Lucerne Publishing'	'Novelty Goods Supplier'	'Prem Prabhu'	'JQ082304802'	30,37659
11,	'Contoso Ltd.'	'Novelty Goods Supplier'	'Hanna Mihhailov'	'B2084020'	7,98253
12,	'Nod Publishers'	'Novelty Goods Supplier'	'Marcos Costa'	'GL08029802'	7,27906
13,	'Northwind Electric Cars'	'Toy Supplier'	'Eliza Soderberg'	'ML0300202'	30,7860
14,	'A Datum Corporation'	'Novelty Goods Supplier'	'Reio Kabin'	'AA20384'	14,46077
15,	'Contoso Ltd.'	'Novelty Goods Supplier'	'Hanna Mihhailov'	'B2084020'	7,98253
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20,	'Litware Inc.'	'Packaging Supplier'	'Elias Myllari'	'BC0280982'	30,95245
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25,	'The Phone Company'	'Novelty Goods Supplier'	'Hai Dam'	'237408032'	30,56732
26,	'Woodgrove Bank'	'Financial Services Supplier'	'Hubert Helms'	'28034202'	7,94101
27,	'Consolidated Messenger'	'Courier Services Supplier'	'Kerstin Parn'	'209340283'	30,94101

- d. **Equipment Transaction:** This contains the following table structure

--- Equipment Transaction Table-----

TransID **int**
TransDate **datetime**
CustomerID **int**
EquipmentID **int**
Quantity **float**
GrossAmount **decimal**(12,2)
DiscountAmount **decimal**(12,2)
FloatRateAmount **decimal**(12,2)
FloatExceededAmount **decimal**(12,2)
PostalVariationAmount **decimal**(12,2)

Business rules

1. TransID - This is auto increment Identity primary key
2. TransDate - This denotes the date of the transaction
3. CustomerID - This is derived from the Customer Table
4. EquipmentID - Derives from equipment table
5. Quantity- This is auto generated amount
6. GrossAmount - (Unit price of the equipment) * Quantity
7. DiscountAmount - Discount amount on the equipment applies to quantities purchased i.e. this applies irrespective of the number of quantity purchased
8. FloatRateAmount - Float rate applies to quantities purchased that fall between 100 and 150
9. FloatExceededAmount - Float exceeded rate applies to quantities more than 150
10. PostalVariationAmount - This is derived based on customer postal code:
 - i. Postal Code 7000 to 50000 then variable rate 0.002
 - ii. Postal Code 50001 to 70000 then variable rate 0.050
 - iii. Postal Code 70001 to 90000 then variable rate 0.062
 - iv. Postal Code 90001 above then variable rate 0.0078

Business Requirements

1. Create an E-R model for the conceptual, logical and physical on SQL Server
2. Populate Float Category, Equipment and Customer with the provided data
3. Generate 1M rows of equipment daily transactional data for 4 years start from January 1, 2015 to May 31, 2019 for testing S&M Software based on the business rules and set of the dataset defined above
4. Create a dynamic function that produce top N customer purchased Amount by year
E.g. Top 10 customers with highest purchased in 2019
Select * from TopCustomer (2019, 10)

5. Dataset and summary data are needed for testing S&M Software

Equipment	2015	2016	2017	2018	2019
Cup -Lock System of Shuttering	\$14000.32	\$1500.00	\$12234.00	\$1455534.00	\$4554554.00
Bar Bending & cutting machine	\$12234.00	\$160994.00	\$12234.00	\$563444.00	\$5667774.00
Total	\$12234.00	\$180009.00	\$12234.00	\$567774.00	\$4890764.00