

Loyalty Program Report

Problem Solving Steps:

A) Data Preprocessing :

- Dates were converted to str numbers then to int numbers.
- Any data between 1-Jan-2020 and 31-Dec-2021 have been deleted.

B) Data Analysis :

- The total number of active customers is found after excluding any customers that were not active during 2019.
- Total spend and Total Number of transactions were calculated for both registered and unregistered.
- Spend per Transaction were found for the two types of customers.
- Data was sorted by years then by months.
- Then the sum of all the columns for each year was found.
- Annual growth rate equation was applied to find the growth rate for New customer registrations and Total spend by registered customers.
- Percentage of registered customers out of the total in terms of transactions and spend were calculated and it's changed over years.
- Based on all of the above, recommendations have been made.

Calculations:

1- Total active accounts

A) Customers Data :

After eliminating all accounts that have Last purchase date less than 1-Jan-2019 , this table is produced :

Countries	Active accounts number
Bahrain	292
KSA	309
Kuwait	280
Oman	245
Qatar	295
UAE	280

Taking sum for numbers, the result will be :
1,701 Active accounts

B) Transaction Data :

Taking the data from Jul-2019 to Dec-2019 , these accounts are fully confirmed that they are Active .

Countries	Active accounts number
Bahrain	703
KSA	6355
Kuwait	1845
Oman	915
Qatar	1944
UAE	4649

Taking sum for numbers, the result will be :
16,411 Active accounts

1701 was calculated based on the '1 year prior Dec-2019' condition .

16,411 was calculated based on the '6 months' condition , if any new registration was between Jul-2019 and Dec -2019 , if purchased or not , they are 100% active .

2- Total Spend :

Finding the sum of 'Total spend by registered customers' and 'Total spend by registered customers' columns for each country from Transaction data table :

A) Registered Customers :

Country	Total spend by registered customers
Bahrain	2726453
KSA	7730233
Kuwait	18851258
Oman	665122
Qatar	2805255
UAE	15291368

Taking sum for numbers, the result will be :
48,069,689 AED spend from registered customers.

B) Unidentified Customers :

Country	Total spend by unidentified customers
Bahrain	8747488
KSA	47139049
Kuwait	48217412
Oman	2055966
Qatar	8494869
UAE	56645067

Taking sum for numbers, the result will be :
171,299,851 AED spend from unidentified customers.

So , Unidentified customers spend more than registered customers .

3- Spend per Transaction :

Finding the sum of ‘ Number of transactions made by registered customers’ and ‘Number of transactions by unidentified customers’ columns for each country from Transaction data table :

Countries	Number of transactions made by registered customers
Bahrain	172432
KSA	402881
Kuwait	932824
Oman	49309
Qatar	131529
UAE	820456

Total transaction from registered customers :
2,509,431

Countries	Number of registered customers who made purchases
Bahrain	665087
KSA	3567826
Kuwait	2932599
Oman	207841
Qatar	509130
UAE	3727237

Total transaction from unidentified customers :
11,609,720

Registered Customers Spend per Transaction = Total Spend/Transaction number =
 $48,069,689 / 2,509,431 = 19.15$ AED/transaction.

Unidentified Customers Spend per Transaction = Total Spend/Transaction number =
 $171,299,851 / 11,609,720 = 14.75$ AED/transaction.

$19.15 - 14.75 = 4.4$ AED/transaction.

∴ Registered Customers spend 4.4 AED per transaction more than Unidentified Customers.

4- Growth Rate :

All data were grouped by years :

Year	Total New customer registrations	Total Number of registered customers who made purchases	Total Number of transactions made by registered customers	Total spend by registered custoemrs	Total spend by unidentified customers	Total Number of transactions made by registered customers
2016	59295	263076	356576	7117889	16433934	893191
2017	79451	625471	764813	14588978	47045160	3142896
2018	47371	363988	744544	13921006	53003070	3711922
2019	35928	322287	643498	12441816	54817687	3861711

$$\text{Growth rate} = \left(\left(\frac{\text{end value}}{\text{start value}} \right)^{1/\text{number of years} - 1} - 1 \right)$$

$$\text{growth in loyalty customer} = \left(\left(\frac{35928}{59295} \right)^{1/4} - 1 \right) * 100 = -15.38\%$$

number of registered customers who made purchases growth rate = 7%

number of transactions made by registered customers growth rate = 21.74%

total spend by registered custoemrs growth rate = 20.46%

total spend by unidentified customers growth rate = 49.41%

number of transactions by unidentified customers growth rate = 62.90%

5- Loyalty Program Customers Percentage :

Year	Total Number of transactions made by registered customers	Total spend by registered custoemrs	Total spend by unidentified customers	Total Number of transactions made by registered customers
2016	356576	7117889	16433934	893191
2017	764813	14588978	47045160	3142896
2018	744544	13921006	53003070	3711922
2019	643498	12441816	54817687	3861711
total	2509431	48069689	171299851	11609720

A) In total spend = Total spend by registered custoemrs / (Total spend by registered custoemrs+ Total spend by unidentified customers)

$$= 48069689 / (48069689 + 171299851) = 21.91 \%$$

B) In total transaction number = Total Number of transactions made by registered customers / (Total Number of transactions made by registered customers + Total Number of transactions made by registered customers)

$$= 2509431 / (2509431 + 11609720) = 17.77\%$$

C) The percentages have changed over the years as follows:

Year	Spend
2016	30.22%
2017	23.67%
2018	20.80%
2019	18.49%

spend year 2016 percentage = $7117889 / (7117889 + 16433934) = 30.22\%$

Year	Transaction Number
2016	28.53%
2017	19.57%
2018	16.70%
2019	14.28%

Transaction number year 2016 percentage =

$$356576 / (356576 + 893191) = 28.53\%$$

6- First Recommendation Explanation (Based on Official studies 2021) :

Annual per capita income in Kuwait = 27,900\$
Annual per capita income in Oman= 17,600\$

Kuwait population = 4.271 M
Oman population = 5.107 M

$$\text{Difference in income} = \frac{27900 - 17600}{27900} * 100\% = 36.91756\%$$

$$\text{Difference in population} = \frac{4.271 - 5.107}{4.271} * 100\% = 19.57387\%$$

So the predicted values if the compare in term of money , Kuwait will be higher than Oman by 36.91%
And if the compare in term of people , Kuwait will be lower than Oman by 19.57%.

	NEW CUSTOMER REGISTRATIONS	NUMBER OF REGISTERED CUSTOMERS WHO MADE PURCHASES	NUMBER OF TRANSACTIONS MADE BY REGISTERED CUSTOMERS	TOTAL SPEND BY REGISTERED CUSTOEMRS	TOTAL SPEND BY UNIDENTIFIED CUSTOMERS	NUMBER OF TRANSACTIONS BY UNIDENTIFIED CUSTOMERS
KUWAIT	36637	556663	932824	18851258	48217412	2932599
OMAN	8490	35253	49309	665122	2055966	207841
REAL PERCENT %	76.82671	93.66708	94.71401	96.47174	95.73605	92.91274
PREDICTED PERCENT	19.57387	19.57387	19.57387	36.91756	36.91756	19.57387
DIFFERENCE IN PERCENT	3.924962	4.785312	4.838798	2.939023	2.91661	4.746774

From the table, we conclude that :

Predicted percent of new registrations is : Oman will be **highr** than Kuwait by 19.57387%.

Real percent 76.82671% shows that , Oman is **lower** than Kuwat by almost 4 times .

7-Total Sums Based on Countries :

Bahrain						
Total	11303	97881	172432	2726453	8747488	665087
2016	978	1750	2177	35176	212866	14592
2017	6502	39726	55128	875481	2425399	179535
2018	2256	30032	62075	994344	3146178	236566
2019	1567	26373	53052	821452	2963045	234394

KSA						
Total	83142	298111	402881	7730233	47139049	3567826
2016	17650	32889	40452	879017	2597877	167624
2017	35168	128635	149815	2920327	13957723	1007008
2018	15792	74600	117557	2120353	14943960	1161880
2019	14532	61987	95057	1810536	15639489	1231314

Kuwait						
Total	36637	556663	932824	18851258	48217412	2932599
2016	20625	171237	242650	4782506	9387344	493789
2017	7937	213794	258011	5187913	11967858	738538
2018	4237	91524	234274	4732351	13394466	847804
2019	3838	80108	197889	4148488	13467744	852468

Oman						
Total	8490	35253	49309	665122	2055966	207841
2016	505	778	939	13704	55560	5123
2017	4100	14271	16903	223701	626860	62875
2018	2036	10354	16156	215693	626498	64215
2019	1849	9850	15311	212024	747048	75628

Qatar						
Total	15311	63813	131529	2805255	8494869	509130
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	10649	26545	53245	1159910	3442077	203916
2019	4662	37268	78284	1645345	5052792	305214

UAE						
Total	67162	523101	820456	15291368	56645067	3727237
2016	19537	56422	70358	1407486	4180287	212063
2017	25744	229045	284956	5381556	18067320	1154940
2018	12401	130933	261237	4698355	17449891	1197541
2019	9480	106701	203905	3803971	16947569	1162693