

Analysis Team

ABC Company

26th October 2022

Bob Nixon

ABC company

Data Analysis on Sandwich making shop

Hi Nixon,

This is final report on customer satisfaction data analysis of sandwich making store. Data of customer satisfaction, waiting time, time for payment, age category and other factors that contribute to analysis for the month of February 2022 studied. Below are the list documents for reference.

Group 10-Case study on Sandwiches v3.xls

Group 10-Case Study and Report.doc

Documents has insights on which day of the week is the busiest, customer gender and which age category customers are mostly visiting the store, which product is mostly bought, customer satisfaction on the product and others.

We are keen on your feedback on the analysis. Kindly let us know for any improvement or suggestions on changes.

Regards,

Team

Course Code: **INFO 8135**

Course Title: **Descriptive analysis**

Data Source: **Group 10- Case study on Sandwiches
v3**

Authors:

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Date: **October 25, 2022**

Version: **Group 10: Case Study and Report 1 - Interesting Patterns and
Trends V1**

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1.0 Document History

Dates	Versions	Changes	Responsible
19/10/2022	Group 10- Case study on Sandwiches v1	Adding the reference lists for satisfaction, day of week, age range, and gender list to ReadMe First instead of separate sheets to reduce excess sheets	MO
12/10/2022	Group 10- Case study on Sandwiches v2	Creating the wait time values on the Issues DM instead of on new sheets to reduce excess sheets	AC

2.0 Executive summary

The Sandwich making shop has several business divisions, and their management requires further analysis on the customer satisfaction data, so they will be in a strong position to take a decision. Post further analysis of customer satisfaction data the firm wants to prepare a Case Study digital (PDF) report to discuss with the Sandwich Shop Management team. To proceed with the analysis, we have used various formulas, charts, and pivot tables to ensure the analysis is clear and understandable to the management team.

Findings and recommendations

The datasets are analysed and cleaned using VLOOKUP's and other formulas to ensure the data are structured for analysing. Using the issues and requirements document we have analysed the findings related to the document and made sure all the findings are completed.

The key reasons are as follows

- The report explains the list of customers bought Economy, Regular, and Deluxe sandwiches bought by each customer.
- The customer demographics like customer's gender and their age categories.
- The count of waiting time for each customer in the Sandwich shop.
- The report provides a major insight on whether the customer is satisfied with the hospitality of the Sandwich shop.
- The report can lead us through the end point of the results with clear insights on decision making.
- The pivot tables can help us in analysing sandwich category wise data and the busiest and non-busy time slots.

Key contents

- Sandwiches sales Answering Data Model
- Customer demographic profile
- waiting time to order
- waiting time to start paying
- Data Quality
- Documentation

Background of the project

Using checkout data, we have segregated the data into various sheets. Then further calculations are calculated to find the customer satisfaction, waiting times involved in ordering, start paying. Using the data, we can fall into a conclusion of customer satisfaction for each customer. Using pivot filters, we have the data segregated year wise data to ensure the management team has a clear view of the results.

Highlights of the project are as follows

1. List of orders segregated in Sandwich category wise
2. Customer demographics analysis
3. Count of waiting time involved at each order
4. Sum of time taken for topping

3.0 Statement of Confidence and Concerns about the Dataset(s)

This is an evaluation of quality of the dataset and data involved in analysis.

Dataset: **CheckoutsK**

- AgeRanges: Has data for age range of customers.
- CheckOutData: Has data for wait time, products purchased and other details on purchase.
- Genders: Gender category of customers
- Satisfactions: Has customer satisfaction data showed as satisfaction text.

Analysis on worksheet is done on sheets listed below

- CheckoutDM: Shows the checkout data model
- I4 DM: Has the data and strategy for issue 4.
- I5 S FA: Issue 5 Strategy and Frequency Analysis.
- I6 S FA: Issue 6 Strategy and Frequency Analysis.
- I7 S FA: Issue 7 Strategy and Frequency Analysis.
- I8 & I9 DM: Has data model for issue 8 and issue 9
- I8 S: Issue 8 Strategy and Frequency Analysis.
- I9 S: Issue 9 Strategy and Frequency Analysis.
- Quality: Has analysis of data quality issue
- Satisfactions: Shows the frequency on issue 4.

Dataset	Concern on quality	Rating on effects of concern
Checkoutdata on sheet CheckoutData	No data for columns 'CashierID', 'CashierMoodID' and 'CustomersInLineup'	Medium
SatisfactionRating list table on ReadMeFirst sheet	No Concern	Low
AgeRangeList from ReadMeFirst sheet	No concern	Low
Genderlist from ReadmeFirst sheet	No concern	Low
Dayofweek list from ReadMeFirst sheet	No concern	Low

4.0 Guided tour of Descriptive analytics work

4.1 Issue 4: customer satisfaction profile-See workbook "Group 10- Case study on Sandwiches v2", "I4 DM" and" satisfaction" worksheet.

We created count of the different levels of customer satisfaction and count of per day of week of different levels of satisfaction

Count of CustSatisfactionID	Column Labels							
Row Labels	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Grand Total
2 - This store should close	69	5	7	2	4	11	7	105
3 - I was ready to walkout, but didn't	180	48	52	27	36	78	89	510
4 - Slow service, need more staff	177	90	92	71	76	124	146	776
5 - Food is Ok, Need Faster Service	85	71	62	78	68	78	96	538
6 - Food is Good, Need Faster Service	41	31	34	36	49	34	39	264
7 - Good in All Ways	11	15	14	23	14	13	12	102
8 - Very Good in All Ways	91	136	118	127	121	108	116	817
9 - Very, very good	102	107	116	139	128	120	111	823
Grand Total	756	503	495	503	496	566	616	3935

4.2 Issue 5: sandwiches sales-See workbook "Group 10- Case study on Sandwiches v2", "I5 S FA" worksheet.

We created sum of all sandwiches for all days of week and hour of day, for each sandwich type. See image below for economic bought.

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4.3 Issue 6: customer demographic profile- See workbook "Group 10- Case study on Sandwiches v2", "I6 S FA" worksheet.

We created pivots to show the count of age range and gender together, then separately. See below age range and gender

Age Range and Gender							
Count of GenC Column Labels							
Row Labels	00 to 09	10 to 18	19 to 30	31 to 50	51 to 65	Senior	Grand Total
Female	196	221	226	215	261	214	1333
Male	208	223	199	196	213	233	1272
Unclear	236	221	212	223	217	221	1330
Grand Total	640	665	637	634	691	668	3935

4.4 Issue 7: waiting time to order a sandwich- See workbook "Group 10- Case study on Sandwiches v2", "I7 S FA" worksheet.

We Created a range for waiting time with 1 min intervals and used it to count the wait time value for an order

Row Labels	Count of waiting time(mins)
0-1	3642.00
1-2	68.00
2-3	27.00
12-13	17.00
8-9	16.00
6-7	15.00
4-5	14.00
27-28	11.00
3-4	10.00
22-23	10.00
9-10	9.00
5-6	9.00
17-18	7.00
10-11	6.00
28-29	6.00
18-19	6.00
11-12	6.00
30-31	6.00
31-32	6.00
24-25	6.00
7-8	5.00
25-26	5.00
14-15	5.00
23-24	4.00
13-14	4.00
21-22	4.00
29-30	2.00
19-20	2.00
26-27	2.00
20-21	2.00
16-17	2.00
15-16	1.00
Grand Total	3935.00

4.5 Issue 8: profile of waiting time to start topping the sandwich- See workbook "Group 10- Case study on Sandwiches v2", "I8 S" worksheet.

We Created a range for waiting time with 1 min intervals and used it to sum the topping time value for an order

Waiting Time Value(1 min)	Sum of Time taken for topping(mins)
0-1	1285.716667
10-11	4.033333333
11-12	6.833333349
1-2	158.1500001
12-13	14.23333337
13-14	2.733333323
14-15	2.649999991
15-16	0
16-17	3.016666667
17-18	4.299999989
18-19	4.166666666
19-20	0
20-21	2.833333336
21-22	2.550000009
22-23	5.949999997
2-3	41.85000004
23-24	6.366666667
24-25	5.800000015
25-26	1.749999999
26-27	1.216666668
27-28	8.433333335
28-29	3.100000012
29-30	4.516666675
30-31	2.200000011
31-32	4.333333334
3-4	13.01666667
4-5	9.600000012
5-6	6.383333327
6-7	9.783333347
7-8	4.950000005
8-9	9.783333336
9-10	7.933333344
Grand Total	1638.183334

4.6 Issue 9: profile of waiting time to start paying for the purchases- See workbook “Group 10- Case study on Sandwiches v2”, “I9 S” worksheet.

We Created a range for waiting time with 2 mins intervals and used it to sum the start paying time value for an order

Waiting Time Value(2 min)	Sum of Time taken for start pay(mins)
0-2	4789.249994
10-12	84.1333329
12-14	163.7666657
14-16	41.3999998
16-18	67.18333291
18-20	65.76666618
20-22	54.43333292
22-24	137.8166656
2-4	181.7666662
24-26	125.0499989
26-28	153.066665
28-30	101.6999989
30-32	168.9166649
4-6	123.4999995
6-8	127.916666
8-10	181.0333322
Grand Total	6566.699982

5.0 Guided tour of work management

In this section we are expressing the guided tour of further analysis of customer satisfaction data for the Sandwich making shop. The data used was supplied by the shop and the analysis data which we are preparing must be shared with the shop’s management.

The data used here is ‘Case study on Sandwiches v3’ and the checkout data provides us insights on the order ID, time of the order, pay time, and different categories of sandwich types. The checkout data is used for the further analysis of customer satisfaction.

CheckoutID	DayofYear	DayofWeek	TimeArrive	TimeStartOrder	TimeStartTop	ActualStartTop	TimeStartPay	ActualStartPay
35502	06-Feb-22	1	11:00:00 AM	11:00:00 AM	11:01:00 AM	11:01:00 AM	11:01:47 AM	11:01:47 AM
35503	06-Feb-22	1	11:00:18 AM	11:00:30 AM	11:01:25 AM	11:01:47 AM	11:02:10 AM	11:02:32 AM
35504	06-Feb-22	1	11:00:47 AM	11:00:55 AM	11:01:21 AM	11:02:10 AM	11:02:40 AM	11:03:29 AM
35505	06-Feb-22	1	11:01:16 AM	11:01:21 AM	11:01:55 AM	11:02:40 AM	11:02:50 AM	11:04:09 AM
35506	06-Feb-22	1	11:01:38 AM	11:01:55 AM	11:02:21 AM	11:02:50 AM	11:03:37 AM	11:04:49 AM

We have used the ‘ReadMe First’ sheet in ‘Case study on Sandwiches v3’ workbook which explains all the sheets involved in this workbook and what exactly been explained in that sheets at ‘Description’ column.

Sheet	Description
ReadMeFirst	Name and description of sheets
Deliverables	Deliverables
Workflow	Workflow
Checkout Data set	Checkout Data set
CheckoutDM	Checkout Data Model
I4 DM	Issue 4 Data Model
Satisfactions	Issue 4 frequency analysis
I5 S FA	Issue 5 Strategy and Frequency Analysis
I6 S FA	Issue 6 Strategy and Frequency Analysis
I7 S FA	Issue 7 Strategy and Frequency Analysis
I8 DM	
I8 S	
I9 S	
Quality	Issue 10 analysis

In the ‘Deliverables’ sheet we have explained the list of deliverables and its description. it also provides the list of timings involved with Start, checked and finish times.

The deliverables sheet – description column explains the customer satisfaction profile, sandwich sales data, customer demographic profile, order waiting time, waiting time to start topping, waiting time to start paying, data quality and its documentation. The deliverables sheet can be found in the ‘Case study on Sandwiches v3’ excel workbook.

ID	Deliverable Name/Description	Started Date	Started Time	Checked Date	Checked Time	Finished Date	Finished Time
10	Customer satisfaction profile-See I&R Requirements 9 &10	20/10/2022	12:00	20/10/2022	13:00	21/10/2022	14:00
11	Sandwiches sales-See I&R Requirements 11 &12	21/10/2022	12:00	21/10/2022	15:00	22/10/2022	15:30
12	Customer demographic profile-See I&R Requirements 13 &14	22/10/2022	1:00	22/10/2022	16:00	23/10/2022	16:15
13	waiting time to order-See I&R Requirements 15 &16	23/10/2022	12:00	23/10/2022	12:20	23/10/2022	13:05
14	waiting time to start topping-See I&R Requirements 17 &18	23/10/2022	14:00	23/10/2022	14:20	24/10/2022	14:50
15	waiting time to start paying-See I&R Requirements 19 &20	24/10/2022	13:00	24/10/2022	13:40	24/10/2022	14:00
16	Data Quality-See I&R Requirements 23 &24	24/10/2022	12:00	24/10/2022	12:10	24/10/2022	12:15
17	Document the process-See I&R Requirements 25 &28	25/10/2022	14:00	26/10/2022	16:00	26/10/2022	19:00

The workflow sheet – actions column explains the list of actions involved in the analysis like gathering the dataset, creating Data models, customer satisfaction profile, analysis on sales per day, customer

demographics, creating and documenting waiting times on event, ordering, topping and paying. Also provides the insights on data quality used in the analysis and documenting each process involved here. The workflow sheet can be found in the 'Case study on Sandwiches v3' excel workbook.

Action ID	Action	Decision	Estimated Time
1	Gathering dataset from access file for analysis	18/10/2022	5 mins
2	Creating Data Model for issues	19/10/2022	20 mins
3	Creating customer satisfaction profile	20/10/2022	10 mins
4	Analysis on sales of sandwiches each day	21/10/2022	10 mins
5	Data profile on customer demographics	22/10/2022	12 mins
6	Creating and documenting model to analyze waiting time to start event	23/10/2022	15 mins
7	Creating and documenting model to analyze waiting time to start ordering	23/10/2022	15 mins
8	Creating and documenting model to analyze waiting time to start topping sandwich	23/10/2022	15 mins
9	Creating and documenting model to analyze waiting time to start paying	24/10/2022	15 mins
10	Documenting data quality	24/10/2022	12 mins
11	Creating documenting the process	26/10/2022	30 mins

Standards used

We have provided titles like Name for each sheet at the top left corner, besides that source of the data used in that sheet and the which person produced. We have also provided the strategies used in that sheet like formulas used, data findings. The following is an example used at different sheets.

Name:	I6 FA			Source	CheckoutDM	Done By: Aswini			
	I6 Strategy	DM same as Checkout DM							
	Create column for age range text next to age range id column in the CheckoutDM Sheet								
	use vlookup to find the Age range text for the age range id(=VLOOKUP(P10,ReadMeFirst!\$B\$21:\$E\$26,4,FALSE))								
	do same for the other rows								
	Create column for Gender Text next to gender id column in the CheckoutDM Sheet								
	use vlookup to find the gender text for the gender id(=VLOOKUP(R10,ReadMeFirst!\$C\$40:\$D\$42,2,FALSE))								
	do same for the other rows								
	Create Pivots for frequency analysis of Age range								
	Create Pivots for frequency analysis of Gender								
	Create Pivots for frequency analysis of Age range and Gender								
	Age Range								

The reason we have kept the workflow sheet separately is to explain the list of actions involved in each sheet and list of steps involved in each sheet to complete this customer satisfaction analysis. Using the workflow sheet, we can analyse the step by step by process involved in this process.

6.0 Statement of Academic Integrity

We confirm that we will comply with the Academic Integrity rules and acknowledge consequences of not doing so.

Acknowledged by

Student Name	Student ID	Authors Unique Initials
Mojolaoluwa Olaiya	8746330	MO
Aswini Chacko	8779567	AC
Suriya Arivanandhan	8752050	SA

7.0 Conclusion / Summary

Based on the data provided, the issues required to be solved and the analysis done on the data, the following conclusions can be made:

- #4- The Store has the most sales on Sunday with 756 sales and the least sales on Tuesday with 495 sales. Store ratings are also good with 823 very, very good to 105 this store should be closed
- #5- The Deluxe sandwiches have the most sales and on the 12 hour of all days they make the most sales for all types of sandwiches
- #6 The store has more female customers and most of their customers are aged 51-65. The unclear gender and age range of 00-09 have the highest number in the group
- #7 The highest waiting time is between 0-1 minutes and 15-16 has the lowest waiting time
- #8 The highest Topping time is between 0-1 minutes and 15-16 has the lowest topping time
- #9 The highest waiting time to start pay is between 0-1 minutes and 14-16 has the lowest waiting time to start pay.
- #10 Shows that data on employees was not collected.

8.0 References and Source

- 8.1** Excel Sheet, Group 10-Case study on Sandwiches v3
- 8.2** INFO8135 Case Study c Weeks 6 and 7 Issues and Requirements 221010
- 8.3** Guidelines for Case Study Report Elements
- 8.4** CheckoutsK Access file
- 8.5** <https://conestoga.desire2learn.com/d2l/le/content/633688/Home> - Week 6: Explaining Customer and/or Social Behaviour - 1st of 2 Weeks
- 8.6** <https://conestoga.desire2learn.com/d2l/le/content/633688/Home> - Week 7: Explaining Customer and/or Social Behaviour - 2nd of 2 Weeks