HIGH LEVEL DESIGN

BUDGET SALES ANALYSIS

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Document Version Control

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Abstract

A resell business involves buying products or services at a lower price and then selling them at a higher price to make a profit. The reseller acts as an intermediary between the original seller and the final consumer, providing convenience and access to a wider market. It requires careful sourcing, marketing, and customer service to succeed in this competitive market.

The dataset is one of the historical sales of a company named Adventure Works which has records for 3 years. Good data driven systemsfor analysing sales can improve the performance of the company and generate more ROI to the stakeholders.

1.Introduction

1.1 Why this High-Level Document?

The purpose of this High-Level Design (HLD) Document is to addthe necessary detail to the current project description to represent a suitable model for coding.

This document is also intended to help detect contradictions prior to coding, and can be used as a reference manual for how the modules interact at a high level.

The HDL Will:

- Present all of the design aspects and define them in detail
- Describe the user interface being implemented
- Describe the hardware and software interfaces
- Describe the performance requirements
- Include design features and the architecture of the project
- List and describe the non-functional attributes like:
  - ❖ Security
  - ❖ Reliability
  - ❖ Maintainability
  - ❖ Portability
  - ❖ Reusability
  - ❖ Application compatibility
  - ❖ Resource utilization
  - ❖ Serviceability

1.2 Scope

The HLD documentation presents the structure of the system, such as the database architecture, application architecture (layers), application flow (Navigation), and technology architecture. The HLD uses non-technical to mildly-technicalterms which should be understandable to the administrators of the system.

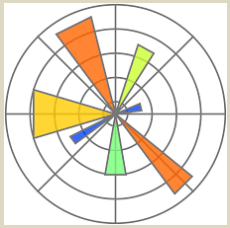
2. General Description

2.1 Product Perspective and Problem Statement:

The goal of this project is to analyze sales and evaluate the performance of the sales team against its target. It provides insights about the top performing and underperformingproducts/services, the problems faced to meet the target and market opportunities and sales activities that generate revenue.

2.2 Tools Used:

Business Intelligence tools and libraries works such as NumPy,Pandas, Seaborn, Matplotlib, MS-Excel, MS-Power BI, Jupyter Notebook and Python Programming Language are used to build the whole framework



3. Design Details:

3.1 Functional Architecture:

STEP 1

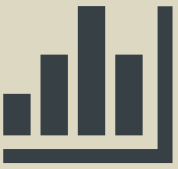
Data from source systemis integrated and loaded into a data warehouse of another analytics repository

STEP 2

Data sets are organised into analytics data models or OLAP cubes to prepare them for analysis

STEP 3

BI analysts, other analyticsprofessionals and business users run analytical queries against the data



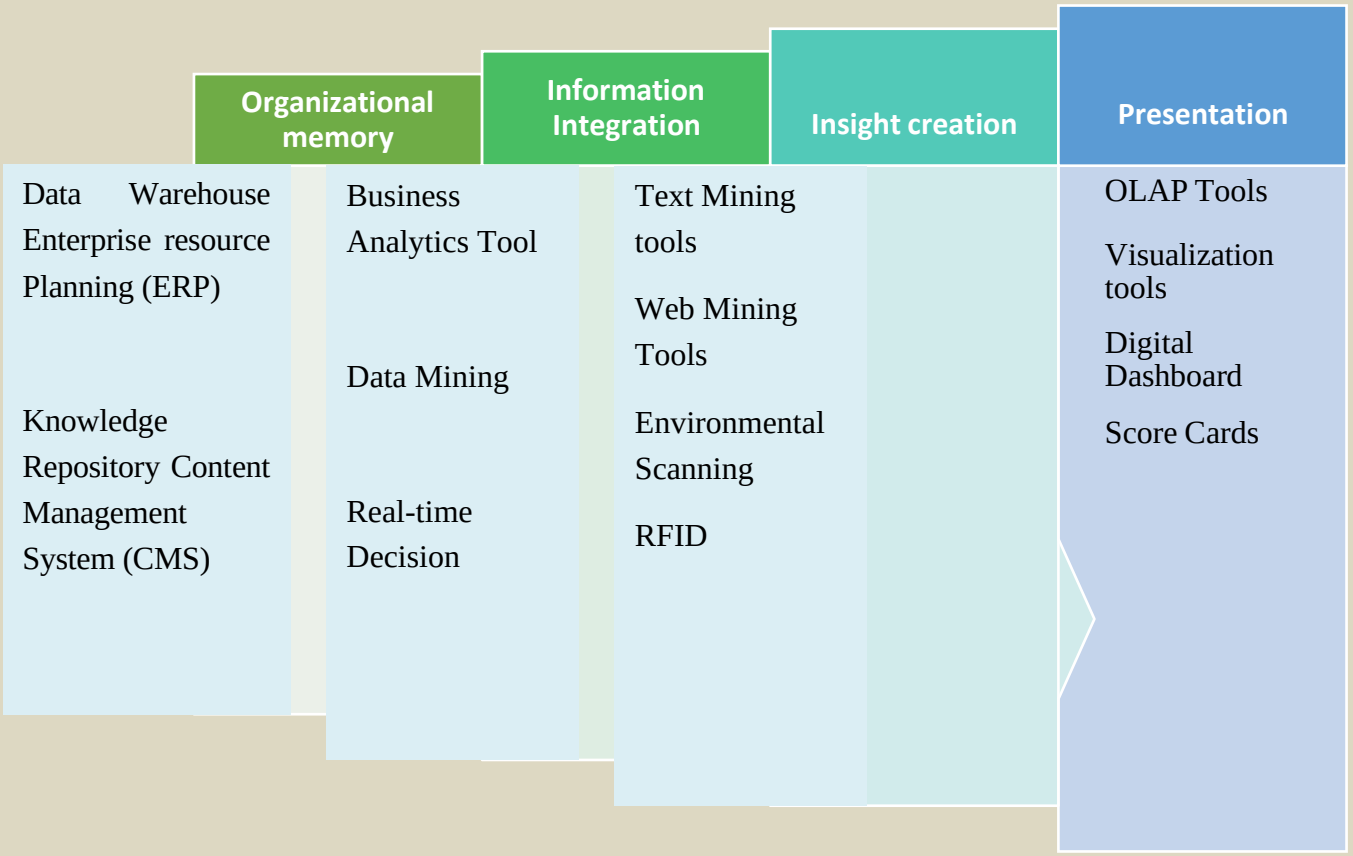
STEP 4

The query results are built into data visualizations, dashboards, Reports and online portals

STEP 5

Business executives and workers use the information for decision-making and strategic planning

3.2 How BI works



3.3 Optimization

3.3.1 Your Data Strategy drives Performance:

- Minimize the number of fields
- Minimize the number of records
- Optimize extracts to speed up future queries by materializing calculations, removing columns and the use of accelerated views

3.3.2 Reduce the marks (data points) in your view:

- Practice guided analytics. There's no need to fit everything you plan to show in a single view. Compilerelated views and connect them with action filters to travel from overview to highly-granular views at the speed of thought
- Remove unneeded dimensions from the detail shelf
- Explore. Try displaying your data in different types of views

3.3.3 Limit your filters by number and type:

- Reduce the number of filters in use. Excessive filters ona view will create a more complex query, which takes longer to return results. Double-check your filters andremove any that aren't necessary
  Use an include filter. Exclude filters load the entire domain of a dimension while including filters do not. An include filter runs much faster than an exclude filter, especially for dimensions with many members
- Use a continuous date filter. Continuous date filters (relative and range-of-date filters) can take advantageof the indexing properties in your database and are faster than discrete data filters
- Use Boolean or numeric filters. Computers process integers and Booleans (t/f) much faster than strings
- Use parameters and action filters. These reduce the query

load (and work across data sources).

3.3.4 Optimize and materialize your calculations:

- Perform calculations in the database
- Reduce the number of nested calculations
- Reduce the granularity of LOD (level of detail) or table calculations in the view. The more granular the calculation,the longer it takes.
- LODs - Look at the number of unique dimension membersin the calculation
- Table Calculations - the more marks in the view, the longerit will take to calculate.
- Where possible, use MIN or MAX instead of AVG. AVG requires more processing than MIN or MAX. Often rowswill be duplicated and display the same result with MIN,MAX, or AVG
- Use Booleans or numeric calculations instead of stringcalculations. Computers can process integers and Booleans (t/f) much faster than strings. Boolean>Int>Float>Date>DateTime>String

4. KPI

Dashboards will be implemented to display and indicate certain KPIs and relevant indicators for the sales

As and when the system starts to capture the historical/periodicdata for a user, the dashboards will be included to display charts over time with progress on various indicators or factors

4.1 KPIs (key performance indicators):

Key indicators displaying a summary of the sales generation and its relationship with different metrics

1. Sales trend line
2. Cost trend line
3. Average unit cost and price
4. Revenue generated by Subcategory
5. Sales by Product Line
6. Revenue contribution by region
7. Profit contribution by region
8. Profit % by region

9. Current year profit margin vs difference in last year's

   profit margin

10. Total orders
11. Total revenue
12. Variance to target comparison by category
13. Variance by month line chart
14. Actual sales and target sales matrix
15. Cohort analysis table
16. Customer retention line chart
17. Monthly spending trend
18. Average monthly spend distribution

5.Deployment:

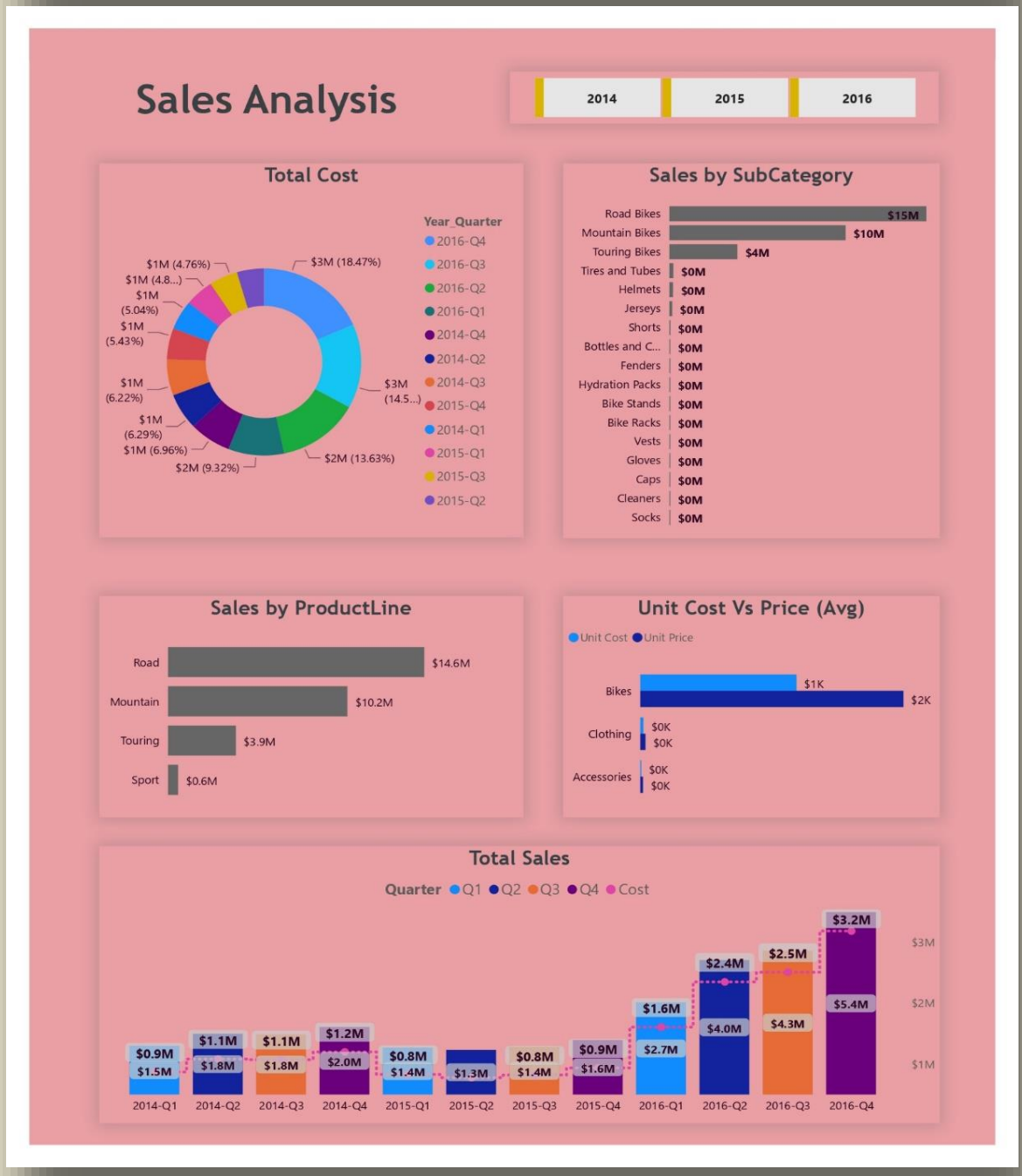
a. Prioritizing data and analytics couldn't come at a better time. Your company, no matter what size, is already collecting data and most likely analysing just aportion of it to solve business problems, gaincompetitive advantages, and drive enterprise transformation.

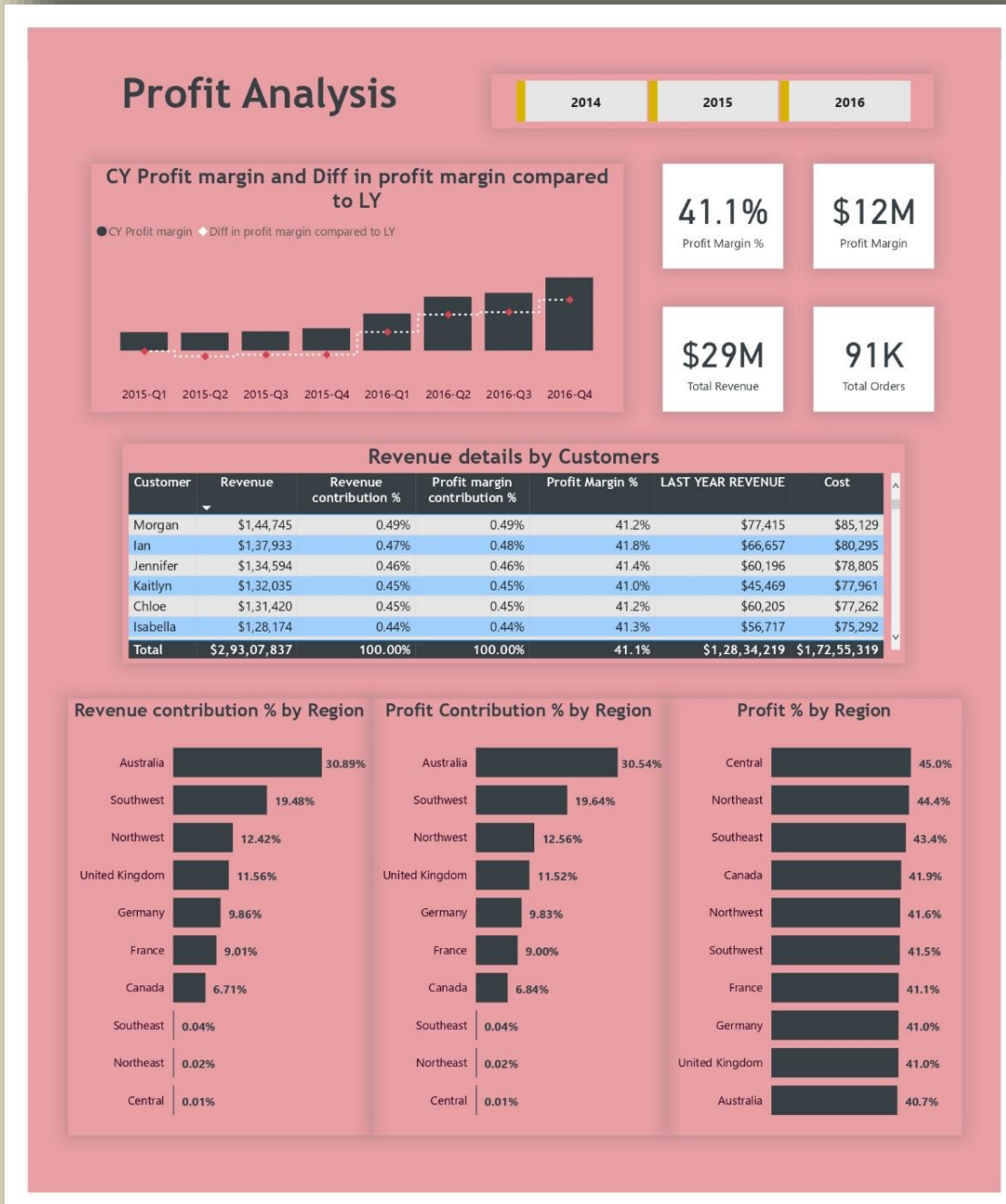
b. With the explosive growth of enterprise data, database technologies, and the high demand for analytical skills, today's most effective IT organizations have shifted their focus to enabling self-service by deploying and operating Power BI at scale, as well as organizing, orchestrating, and unifying disparate sources of data for business users and

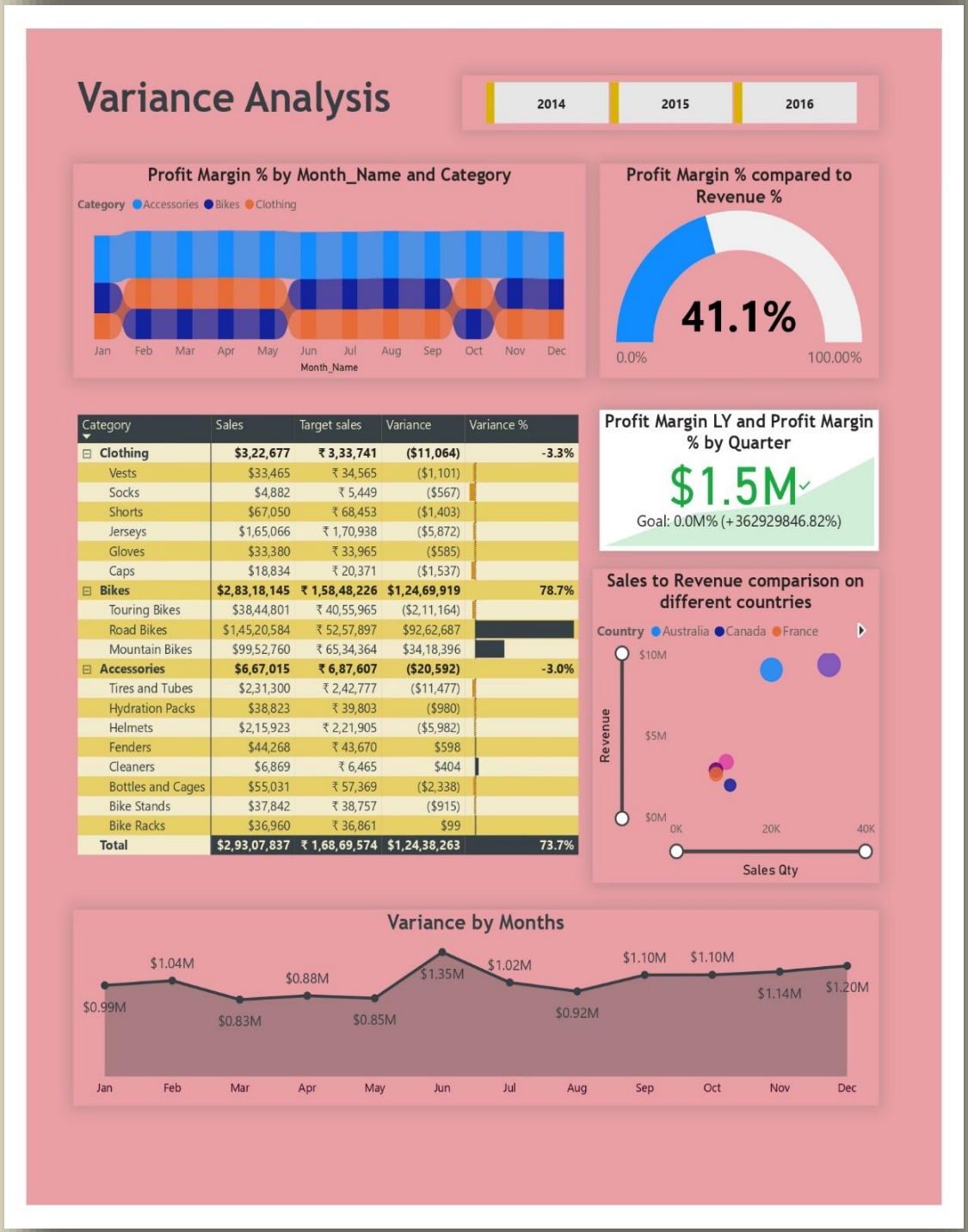
experts alike to author and consume content.

c. Power BI Desktop and Power BI Service leverage your existing technology investments and integrate them into your IT infrastructure to provide a self-service, modern analytics platform for your users. With on- premises, cloud, and hosted options, there is a versionof Power BI to match your requirements.

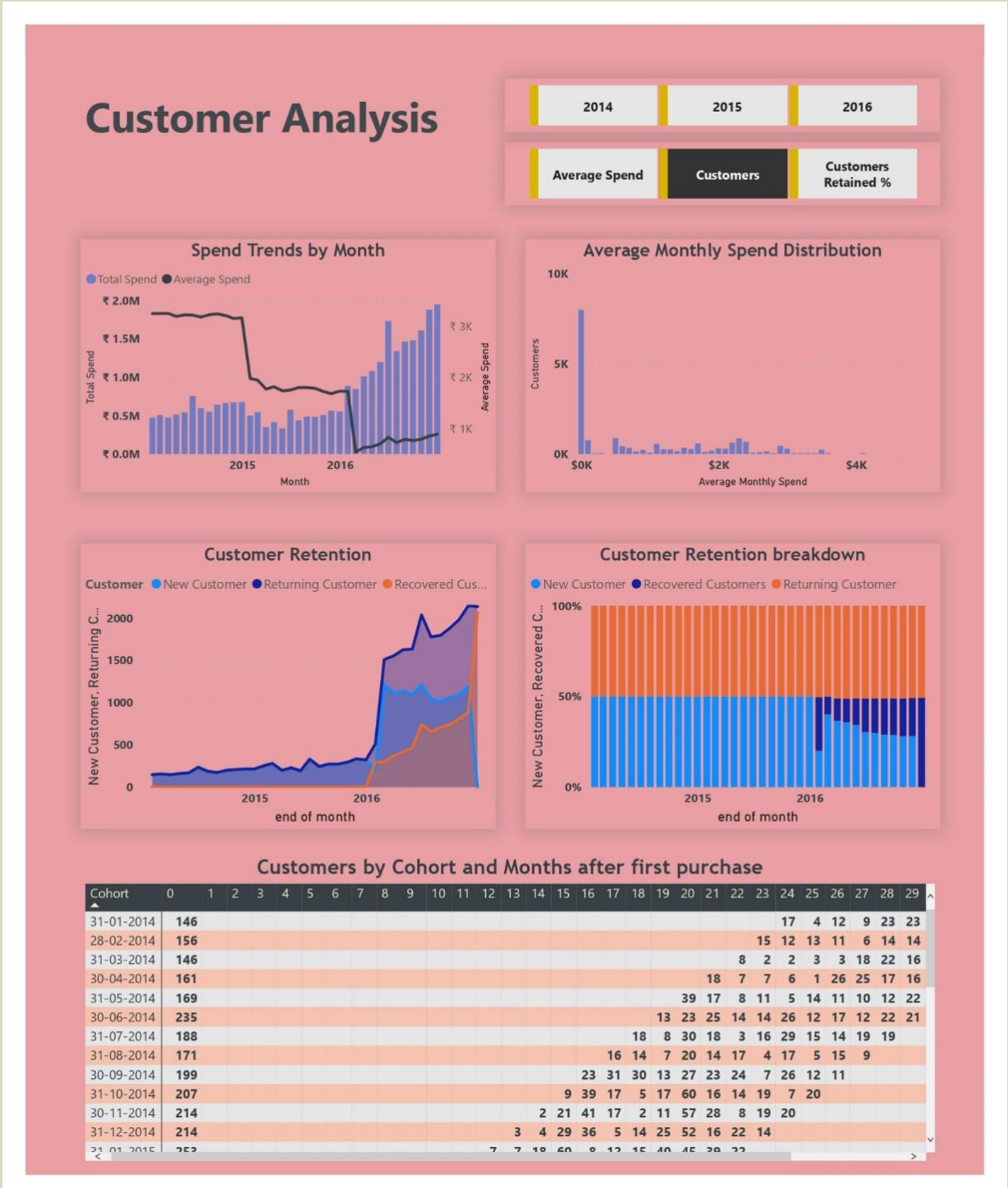
5.1 Power BI Report




Profit Analysis
2014
2015
2016
CY Profit margin and Diff in profit margin compared to LY
CY Profit margin
Diff in profit margin compared to LY
2015-Q1
2015-Q2
2015-Q3
2015-Q4
2016-Q1
2016-Q2
2016-Q3
2016-Q4
41.1%
Profit Margin %
$12M
Profit Margin
$29M
Total Revenue
91K
Total Orders
Revenue details by Customers
Customer
Revenue
Revenue contribution %
Profit margin contribution %
Profit Margin %
LAST YEAR REVENUE
Cost
Morgan $1,44,745 0.49% 0.49% 41.2% $77,415 $85,129
Ian $1,37,933 0.47% 0.48% 41.8% $66,657 $80,295
Jennifer $1,34,594 0.46% 0.46% 41.4% $60,196 $78,805
Kaitlyn $1,32,035 0.45% 0.45% 41.0% $45,469 $77,961
Chloe $1,31,420 0.45% 0.45% 41.2% $60,205 $77,262
Isabella $1,28,174 0.44% 0.44% 41.3% $56,717 $75,292
Total $2,93,07,837 100.00% 100.00% 41.1% $1,28,34,219 $1,72,55,319
Revenue contribution % by Region
Australia 30.89%
Southwest 19.48%
Northwest 12.42%
United Kingdom 11.56%
Germany 9.86%
France 9.01%
Canada 6.71%
Southeast 0.04%
Northeast 0.02%
Central 0.01%
Profit Contribution % by Region
Australia 30.54%
Southwest 19.64%
Northwest 12.56%
United Kingdom 11.52%
Germany 9.83%
France 9.00%
Canada 6.84%
Southeast 0.04%
Northeast 0.02%
Central 0.01%
Profit % by Region
Central 45.0%
Northeast 44.4%
Southeast 43.4%
Canada 41.9%
Northwest 41.6%
Southwest 41.5%
France 41.1%
Germany 41.0%
United Kingdom 41.0%
Australia 40.7%



Category	Sales	Target sales	Variance	Variance %
Clothing	**$3,22,677**	**₹ 3,33,741**	**($11,064)**	**-3.3%**
Vests	$33,465	₹ 34,565	($1,101)	
Socks	$4,882	₹ 5,449	($567)	
Shorts	$67,050	₹ 68,453	($1,403)	
Jerseys	$1,65,066	₹ 1,70,938	($5,872)	
Gloves	$33,380	₹ 33,965	($585)	
Caps	$18,834	₹ 20,371	($1,537)	
Bikes	**$2,83,18,145**	**₹ 1,58,48,226**	**$1,24,69,919**	**78.7%**
Touring Bikes	$38,44,801	₹ 40,55,965	($2,11,164)	
Road Bikes	$1,45,20,584	₹ 52,57,897	$92,62,687	
Mountain Bikes	$99,52,760	₹ 65,34,364	$34,18,396	
Accessories	**$6,67,015**	**₹ 6,87,607**	**($20,592)**	**-3.0%**
Tires and Tubes	$2,31,300	₹ 2,42,777	($11,477)	
Hydration Packs	$38,823	₹ 39,803	($980)	
Helmets	$2,15,923	₹ 2,21,905	($5,982)	
Fenders	$44,268	₹ 43,670	$598	
Cleaners	$6,869	₹ 6,465	$404	
Bottles and Cages	$55,031	₹ 57,369	($2,338)	
Bike Stands	$37,842	₹ 38,757	($915)	
Bike Racks	$36,960	₹ 36,861	$99	
Total	**$2,93,07,837**	**₹ 1,68,69,574**	**$1,24,38,263**	**73.7%**



Customers by Cohort and Months after first purchase

Cohort	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
31-01-2014	146																								17	4	12	9	23	23
28-02-2014	156																							15	12	13	11	6	14	14
31-03-2014	146																						8	2	2	3	3	18	22	16
30-04-2014	161																					18	7	7	6	1	26	25	17	16
31-05-2014	169																				39	17	8	11	5	14	11	10	12	22
30-06-2014	235																			13	23	25	14	14	26	12	17	12	22	21
31-07-2014	188																		18	8	30	18	3	16	29	15	14	19	19	
31-08-2014	171																	16	14	7	20	14	17	4	17	5	15	9		
30-09-2014	199																23	31	30	13	27	23	24	7	26	12	11			
31-10-2014	207															9	39	17	5	17	60	16	14	19	7	20				
30-11-2014	214														2	21	41	17	2	11	57	28	8	19	20					
31-12-2014	214													3	4	29	36	5	14	25	52	16	22	14						
31-01-2015	253												7	7	18	60	8	12	15	40	45	39	22							