INDIVIDUAL ASSIGNMENT

TECHNOLOGY PARK MALAYSIA

CT048-3-M-BIS

BUSINESS INTELLIGENCE SYSTEMS

APDMF2112DSBA(DE)(PR)

TITLE: IMPROVING SALES PERFORMANCE OF WOMEN'S OFF-ROAD BIKE

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APRIL 2022

ABSTRACT

GBI has approached a business intelligence expert to investigate and identify ways to improve the future performance of the company. The sales department is chosen as the pilot run to be investigated and to propose recommendations to improve the sales performance. Investigation into the sales data identified that the women's off-road bike is lagging in sales performance as compared to other bicycle models. The problem is only observed in the United State market which the sales performance in Germany is observed to be relatively similar across the bicycle models. The main cause of the problem is that females are feeling intimidated by the sport which is perceived as male-dominated which discouraged the involvement of female joining into the sport. This has caused the female participation rate in the sport to be very low. Therefore, a low demand of women's off-road bike is observed. Several recommendations are proposed to GBI which include providing women's only biking events, developing women's specific biking gears, engage in online social media female biking communities, and employment of female staffs to promote products. Implementation of the recommendations would not yield immediate results. However, the recommendations would encourage more females to join the sport in the future and eventually leading to an increased demand in women's off-road bicycle.

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LIST OF ABBREVIATIONS

BIS .....Business Intelligence System

ERP .....Enterprise Resource Planning

GBI.....Global Bike Incorporated

OLAP .....Online Analytical Processing

OLTP.....Online Transaction Processing

US .....United States

WORB.....Women's off-road bike

SECTION 1

INTRODUCTION

1.1 INTRODUCTION

Global Bike Incorporated (GBI) is a bicycle company that supplies high-performance bicycles particularly in off-road bicycles and long-distance road bicycles. It was founded in year 2001 in a merger between Heidelberg Composites from Germany and Frankenstein Bikes from United States (US). GBI located in US was registered as a US company and operated a subsidiary called GBI Europe which is stationed in Germany. Both companies work collectively to design, manufacture, and deliver the products all over the world. In addition to selling bicycles, GBI has partnered with bicycle accessories suppliers to provide a range of bicycle accessories in their product line.

The products from GBI are highly specialized and capable of performing customization based on the needs of consumers. Therefore, GBI sells their bicycles exclusively through a network of selected dealers. The dealers would provide the service in advising the consumers in selecting the bicycle with specific customization which are best suited for their needs. Consequently, this has led to limiting the online purchase experience due to the product personalize process requiring the back-and-forth communication to ensure the specific needs of consumers are met. However, the online platform would serve as an information channel which provides product information and product marketing to attract more consumers.

GBI has approached a business intelligence consultancy to request an investigation into the GBI organization to identify methods applicable that can improve the overall performance of GBI. Hence, to kickstart the investigation, the sales department is chosen as a pilot run to undergo the investigation and to provide suitable recommendations to improve the sales performance of GBI. Sales data was provided from GBI which covers the timeline from year 2006 to year 2013. However, to note that year 2013 only contains data for the first two quarters. The investigation would begin by exploring the data to identify issues in the sales of bicycles.

1.2 BACKGROUND

1.2.1 Business Intelligence System

Business intelligence system (BIS) is an umbrella term which comprise of the process of gathering of data, storing of data, methodologies, and data analytics to derive actionable information based on the transformation of data using various tools. Generally, BIS is associated with four capabilities namely organizational memory, information integration, insight creation, and presentation capability.

The first capability of BIS is the organizational memory which is a knowledge pool that accumulates past experiences in the form of data, information, or knowledge which are created within the organization over time that can be used towards future decision making. The information is generally stored in the database of organizations and within the memories of individual employees. There are three stages in the organizational memory process namely acquisition, retention, and retrieval. Acquisition refers to the process of storing new information in memory. Retention refers to the repositories where the past information is stored. Typically, there are five repositories which stores different type of information across the organization namely individuals, culture, transformations, structures, and external activities. Finally, retrieval refers to the process of accessing the stored data. The stored data is then used for making informed decisions to achieve better outcomes. However, accessing the data may be difficult as it can be stored in different repositories.

The second capability of BIS is the information integration which is the aggregation of data from different sources to allow the derivation of valuable insights. The information integration process typically involves collecting, cleaning, transforming, and presenting the data. There are five data integration methods namely manual data integration, middleware data integration, application-based integration, uniform access integration, and common storage integration. Manual data integration refers to manually conducting the integration process from collecting to presenting. Middleware data integration refers to the use of a software to facilitate the data integration between legacy and modern systems. Application-based integration refers to the process of facilitating data integration between different independent applications. Uniform access integration refers to the data integration technique that performs all data integration process but retain data in its original

source. Common storage integration refers to the data integration approach that performs all data integration process in addition to making a copy of the data and storing it.

The third capability of BIS is insight creation which is the ability to develop new insights to facilitate the decision-making process. The insight creation capability facilitates the need for quick results and considerations that information is gathered from a diverse domain due to the increasing complexity of problems involving multiple domains. Generally, insight creation can be derived from three types of analysis namely data analysis, information analysis, and knowledge analysis. Data analysis refers to the derivation of insights based on information available from within the organizational memory such as developing a dashboard displaying important metrics to monitor sales progress. Information analysis refers to derivation of insights based on data gathered on external sources such as performing environmental scanning to collect surrounding information and perform analysis to identify the impact of such information onto the company. Knowledge analysis refers to derivation of insights based on literatures, theories, and standards which are obtained from sources such as books, journal articles, reports, etc.

The fourth capability of BIS is presentation which is the dissemination of data represented in understandable ways to facilitate tactical or strategic decision making. The presentation of data allows patterns to be recognized from the data which can be used in the decision making. Various tools are available to visualize data such as reports, dashboards, scorecards, key performance indicator, etc. Different type of data visualization tool represents information in a different way which would require careful selection of the tools to represent the information to suit the different objectives.

1.2.2 Preliminary Data Exploration

Preliminary descriptive analysis is performed on the sales data to identify a problem which require solving. Figure 1.1 shows the sales quantity of bicycles of every available model.

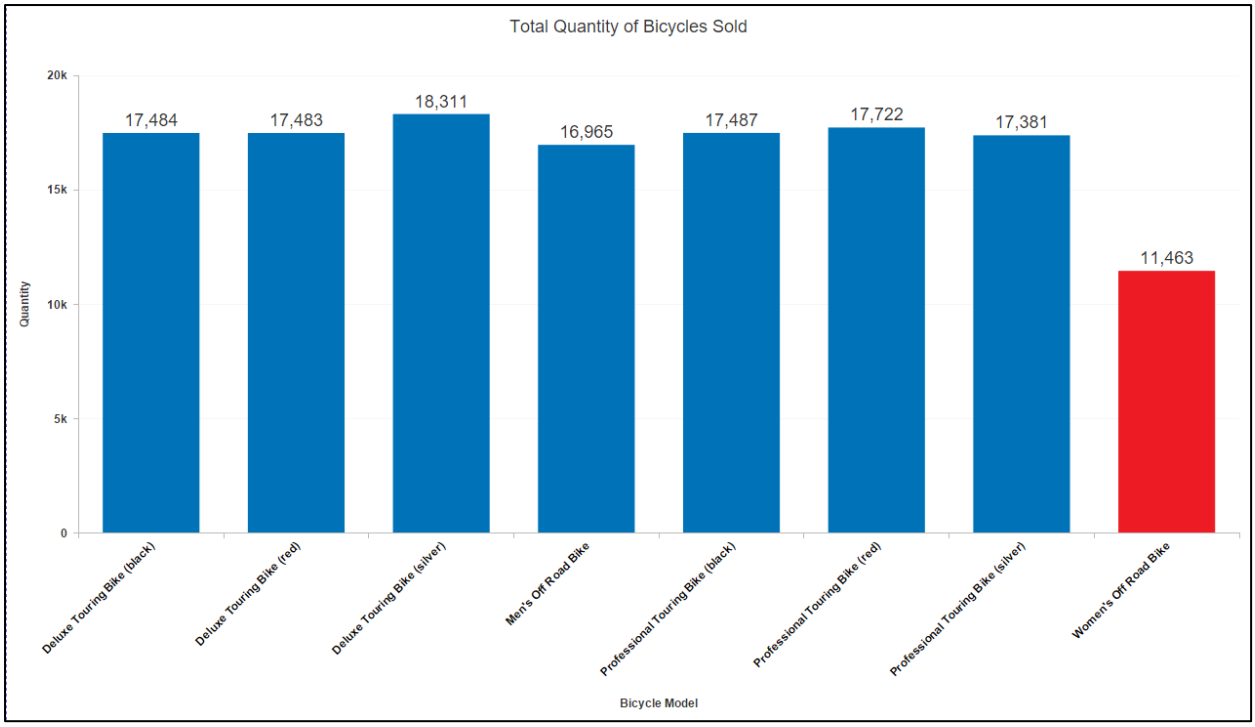

Figure 1.1: Bicycle sales quantity of each model

Based on Figure 1.1, highlighted in red, the women's off-road bike (WORB) is observed to have significantly lower sales quantity as compared to other bicycle models, while it is observed that other bicycle models have relatively similar sales quantity. This may indicate an underlying problem is present that may cause the trend of sales quantity of WORB to deviate from the others. On further investigation, the sales quantity of bicycles in each year is plotted in a heatmap as shown in Figure 1.2.

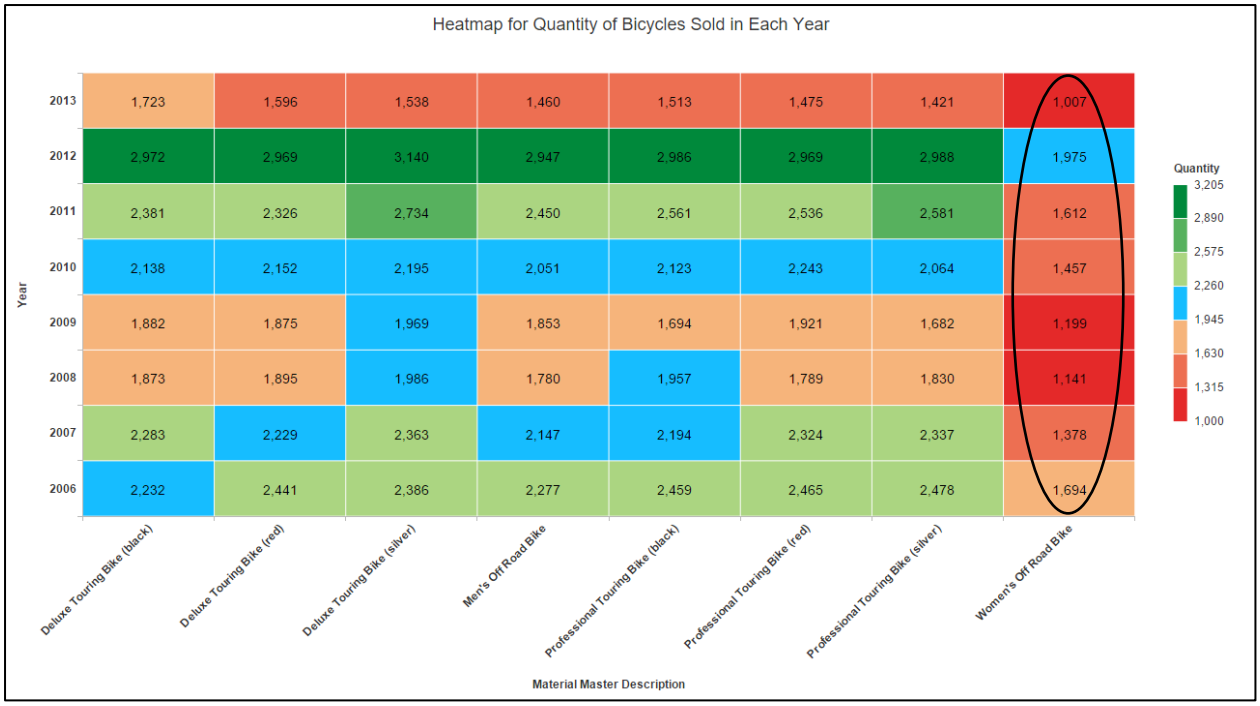

Figure 1.2: Bicycle sales quantity of each model of each year

Based on Figure 1.2, the WORB is observed to have sales across all the years. This indicates the product is not a newly released product and should be aligning with the sales trend of other products. Although the sales performance of other products fluctuates throughout the years, the WORB remained the least performed among the products. Therefore, further investigation is required to identify the reasons of low sales performance. Figure 1.3 shows the average unit cost of each bicycle model.

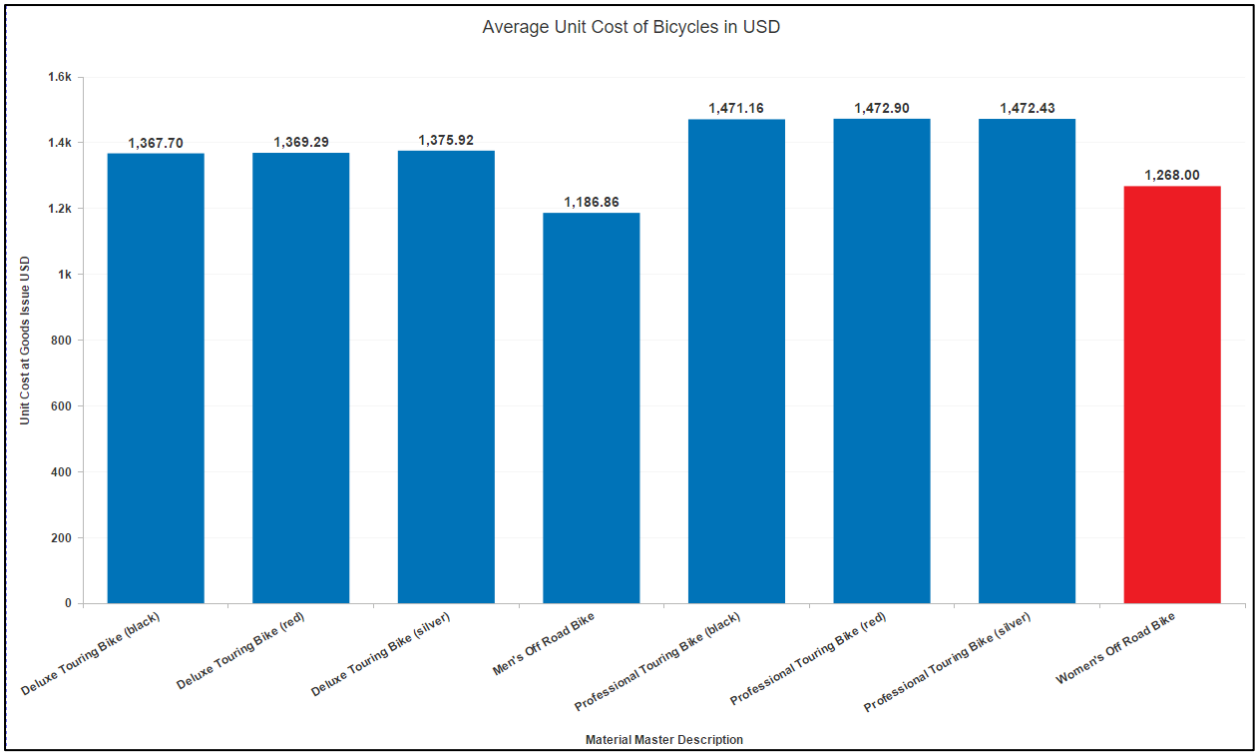

Figure 1.3: Average unit cost of bicycles

Based on Figure 1.3 it is observed that the WORB is not exceptionally expensive in relation to other bicycle models. Although slightly more expensive than the men's off-road bike, the men's off-road bike sales performance is achieving relatively similar sales trend in comparison to touring bicycle models. However, the WORB being more affordable than the touring bicycle models are not achieving sales performance similar to the touring bicycle models.

1.3 PROBLEM STATEMENT

Based on the preliminary data exploration, the WORB is identified to have low sales performance as compared to other bicycle models offered by GBI. Therefore, an investigation should be conducted to investigate the reasons of why the WORB is lagging in terms of sales performance.

1.4 AIM & OBJECTIVES

1.4.1 Aim

The aim of this study is to propose sales strategies to improve the sales performance of the WORB.

1.4.2 Objectives

The objectives of the study are as followed:

1. To identify the reasons for low sales performance in the WORB.
2. To propose strategies to improve sales performance on WORB.

1.5 EXPECTED DELIVERABLES

At the end of this study, several recommendations would be formulated for GBI to consider for implementation. The objectives of the recommendations would be targeted to improve sales performance of WORB.

SECTION 2

ORGANIZATIONAL MEMORY & INTEGRATION

This section outlines the organizational memory and data integration capability implemented within GBI.

2.1 ORGANIZATIONAL MEMORY

GBI has implemented information technology strategy to reduce costs and deliver best available technology to every division globally. The enterprise resource planning (ERP) functions are centralized by the implementation of SAP ERP (version 6.0) which is an ERP software that integrates the main functions of the core business processes. This implementation provided GBI an advanced business platform to achieve consistency in operations and process integrity over all division in both US and Germany.

The use of centralized system would imply the need of a database to store the massive amount of data from different departments with different tasks within the company. Which GBI has adopted the SAP HANA platform to help manage the storage of big data. SAP HANA is a database that adopts in-memory processing which means the capability to process large amount of data very quickly as compared to disk processing.

The use of SAP HANA facilitates both online transaction processing (OLTP) and online analytical processing (OLAP). OLTP provides the capability to process transaction-oriented applications which typically requires immediate responses. Use case of OLTP in GBI would include data entry, financial transaction, and retail sales. In which, these tasks require fast query processing and ability to maintain data integrity in multi-access environments. While OLAP provides the capability to process analytical requests in a database. Multidimensional analysis can be performed on sales data to derive useful insights to drive decision making. Use case of OLAP in GBI would include time-series forecasting and data mining. In which, hidden relationships within data can be discovered and used for improving sales performance.

2.2 INFORMATION INTEGRATION

Data integration is the process of aggregating data from multiple sources. It is typically conducted to allow analysis, reporting, or loading to another application for further processing. Multiple functions can be associated with a data integration tool namely data transformation, mapping, and data cleaning.

Data integration in GBI is important as the company operates in two different countries which would require the merging of systems between the companies in different location as GBI adopts a centralized data platform. This allows GBI to achieve a unified view of the data assets available. Generally, a company has multiple departments which exist to cater for different tasks. Which each of the departments would generate different set of data using different application. Therefore, data integration would facilitate the combination of data from different sources into a single database.

Since GBI has adopted the ERP system which by default would include the data integration capability. This ensures the data generated from different sources would undergo required processes to ensure uniformity of the data format which typically follows a schema before storing into the database. Therefore, data exist in an ERP system is typically structured data which facilitates the data integration process.

SECTION 3

ANALYSIS

This section outlines the analysis performed to derive information from internal and external sources. The analysis performed would include data exploration and analysis, information analysis, and knowledge analysis. As identified in the preliminary data exploration, the sales performance of WORB is lagging as compared to other bicycle models. Therefore, the analysis would focus on identify the reasons that is causing the lag.

3.1 DATA PREPARATION

The sales data provided by GBI exist in the excel file format in which the data were arranged in rows and columns. There are 51 columns and 47992 rows of data available from the dataset. The visualization of the data would be performed using SAP Lumira Discovery which is a self-service visualization analytics software. The software would perform extract, transform, and load (ETL) process to integrate different data sources where initially, raw data is extracted from sources, followed by transformation of the data, and finally loading the processed data into a database.

The following would describe the ETL process on GBI sales data into SAP Lumira Discovery. Figure 3.1 shows the interface of SAP Lumira Discovery for importing data. Since the dataset exist in excel file format, the Microsoft Excel is selected under the data source type. Another interface would arise and to request the directory of the stored file. Navigate to the folder where the dataset is stored and select the dataset.

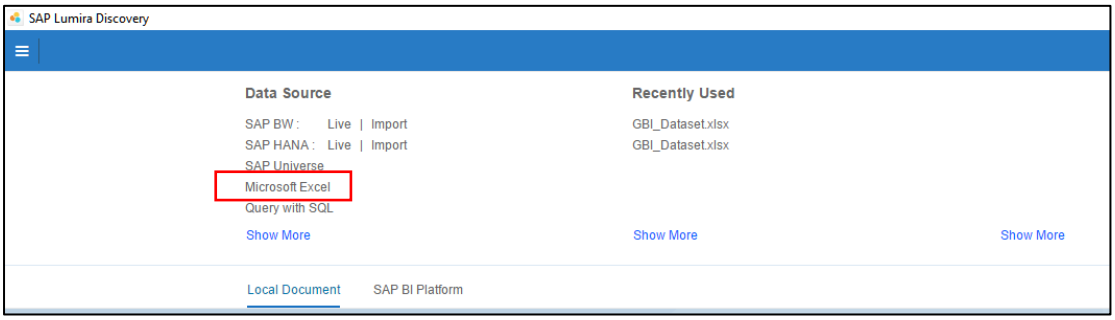

Figure 3.1: Data import interface in SAP Lumira Discovery

Once the dataset is selected for import. An interface to allow configuration onto the dataset prior import would be shown as in Figure 3.2. Configuration of data transformation can be applied here such as selection of rows and columns to be included or excluded. However, for this study the settings would be remained as default.

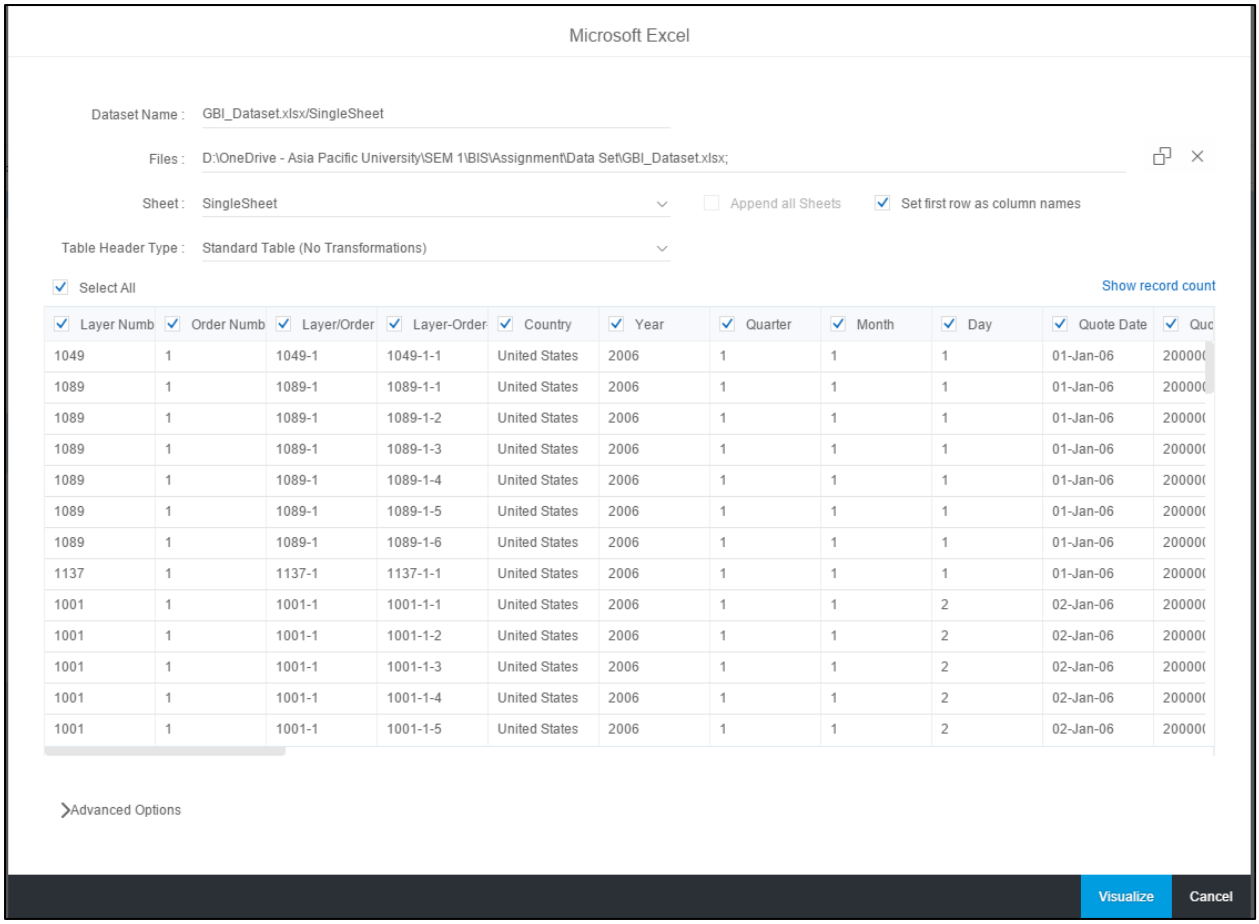

Figure 3.2: Data import configuration interface in SAP Lumira Discovery

When the data has successfully transformed and loaded into SAP Lumira Discovery, an interface with measures and dimensions would be shown as in Figure 3.3. Measures are numeric values that can be measured or calculated while dimensions are qualitative values which can be used for segmenting data to identify patterns. 17 measures were automatically created, and 51 dimensions were derived based on the 51 variables of the dataset.

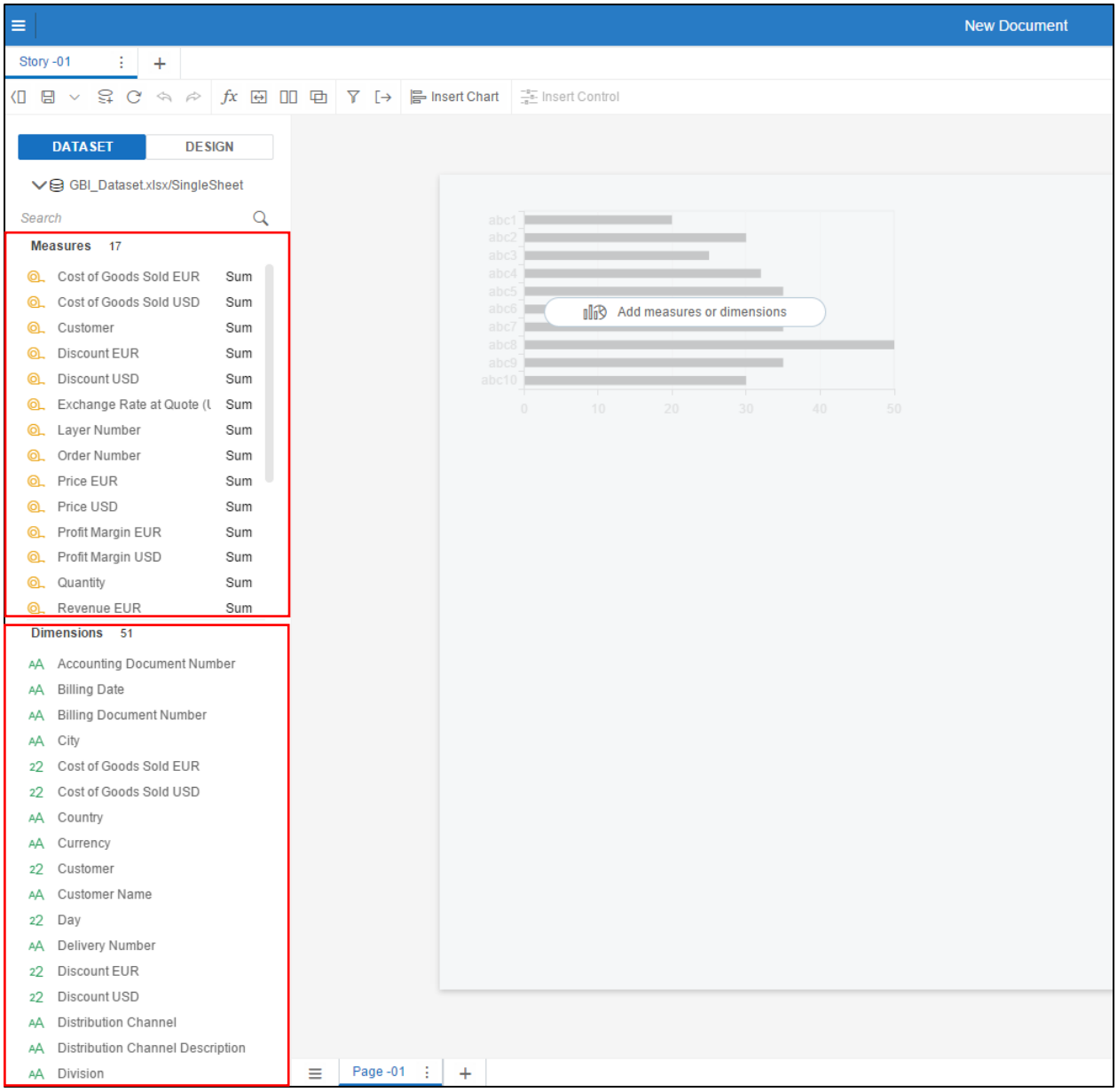

Figure 3.3: Data visualization interface in SAP Lumira Discovery

The measures and dimensions can be dragged and drop into the visualization pane to form visualizations of different type to derive insights from the dataset. Example shown in Figure 3.4 where the revenue in USD is plotted against the country. Insight can be derived based on the visualization, where it is observed that revenue in Germany is much lower than revenue in US.

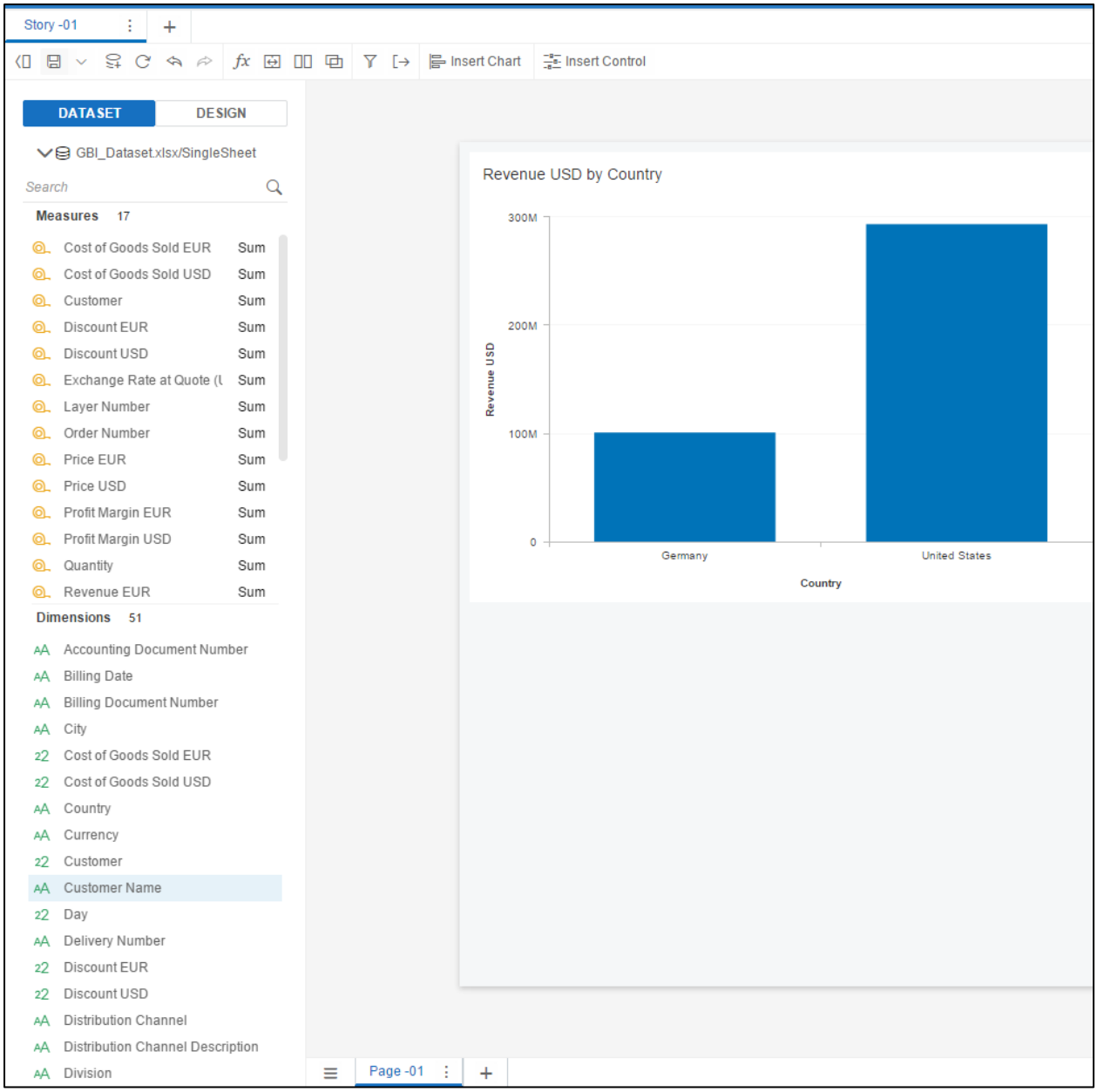

Figure 3.4: Example data visualization of revenue per country

The visualization provides a quick and easy understanding of the data as compared to raw data which exist in rows and columns format. In addition, visualization in SAP Lumira Discovery allows multidimensional features to be visualized into a single chart which would allow identification of hidden patterns and trends in data that would be difficult to achieve using simpler tools such as excel.

3.2 DATA EXPLORATION AND ANALYSIS

Typically, OLAP operates on multi-dimensional data which built on top the concept of an OLAP cube. An OLAP cube consists of data structure made of measures and dimensions which facilitates quick analysis of multi-dimensional data. There exist four types of OLAP analytical operations namely roll-up, drill-drown, slice or dice, and pivot.

Roll-up refers to the aggregation of information which is performed by reducing number of dimensions or climbing up the concept hierarchy. Drill-down refers to fragmentation of information into smaller parts by moving down the concept hierarchy and increasing number of dimensions. Slice or dice refers to the selection of sub-cube by applying filter to select subcategories within dimensions. Pivot refers to rotating axes of data to provide a different point of view of the data.

This section documents the analysis performed, to identify the causes of low sales performance on WORB. Particularly, the drill-down and slice operation of OLAP analytics are performed to identify the causes.

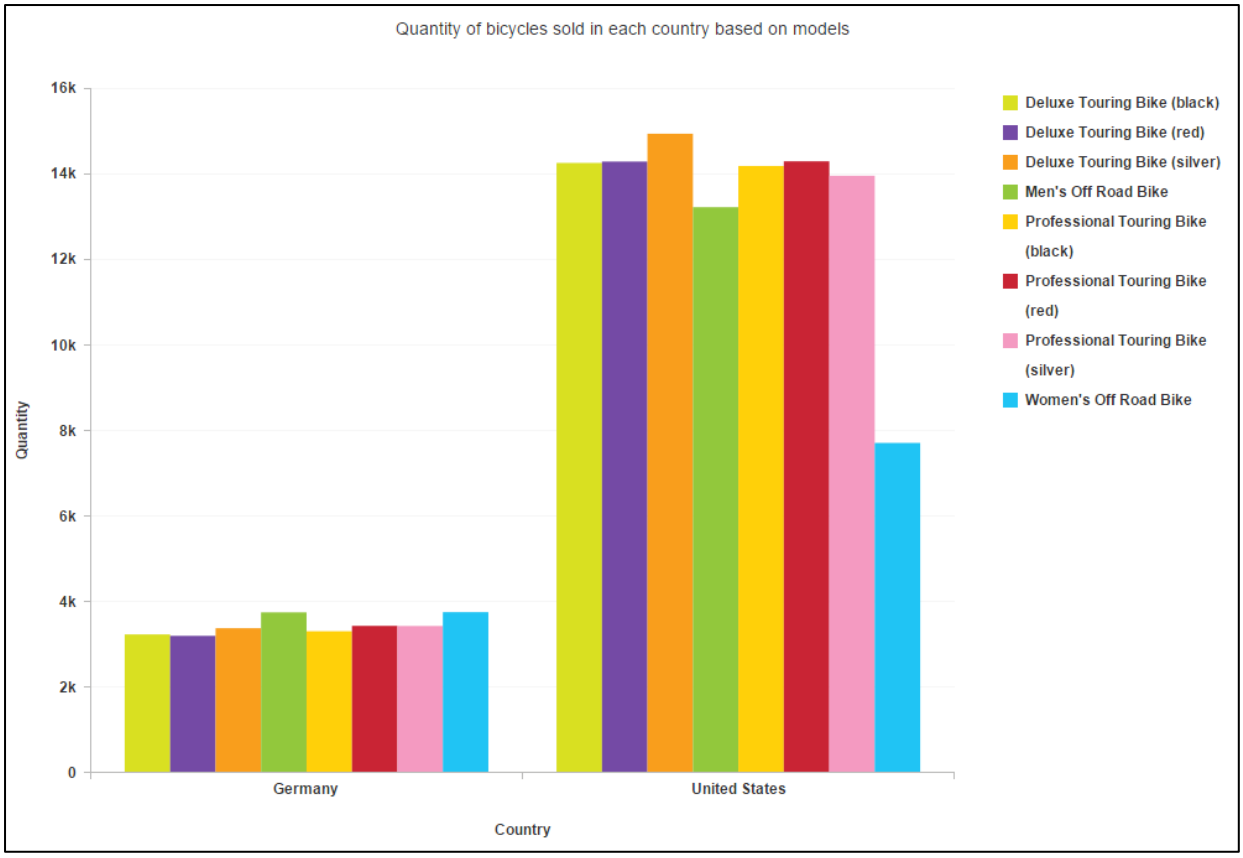

Figure 3.5: Bicycle sales quantity of each model in each country

Based on Figure 3.5, it is observed that all bicycle models have relatively similar sales quantity in Germany. However, in the US, the sales quantity of WORB is observed to be significantly less than other bicycle models. Further investigation is required into the US market thus the following analysis would focus only in the US market to identify the possible causes. Figure 3.6 shows the yearly sales quantity of each bicycle model in US market.

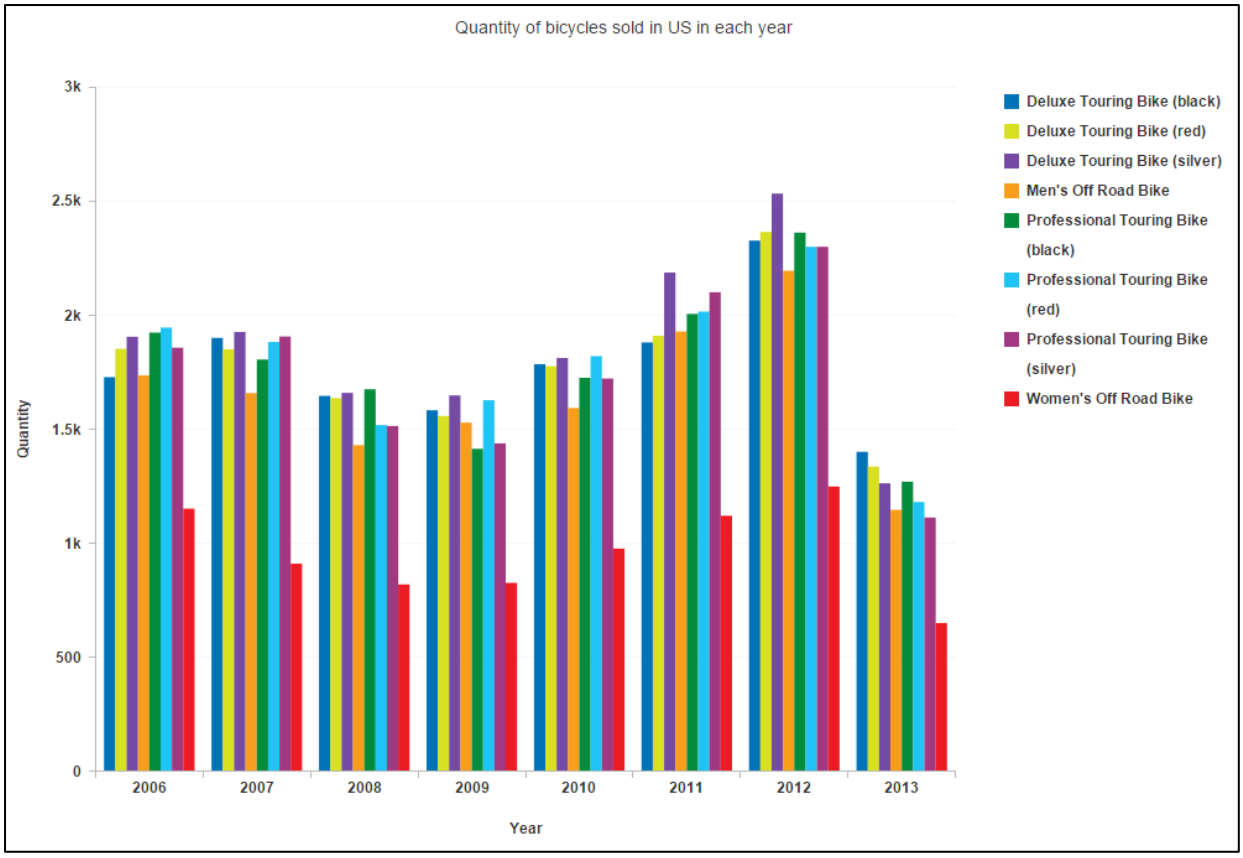

Figure 3.6: Yearly bicycle sales quantity of each model in US

Based on Figure 3.6, it is observed that there exists a trend throughout the years where the sales quantity of WORB is significantly less than other bicycle models. Figure 3.7 shows the sales quantity of bicycle in each city in US.

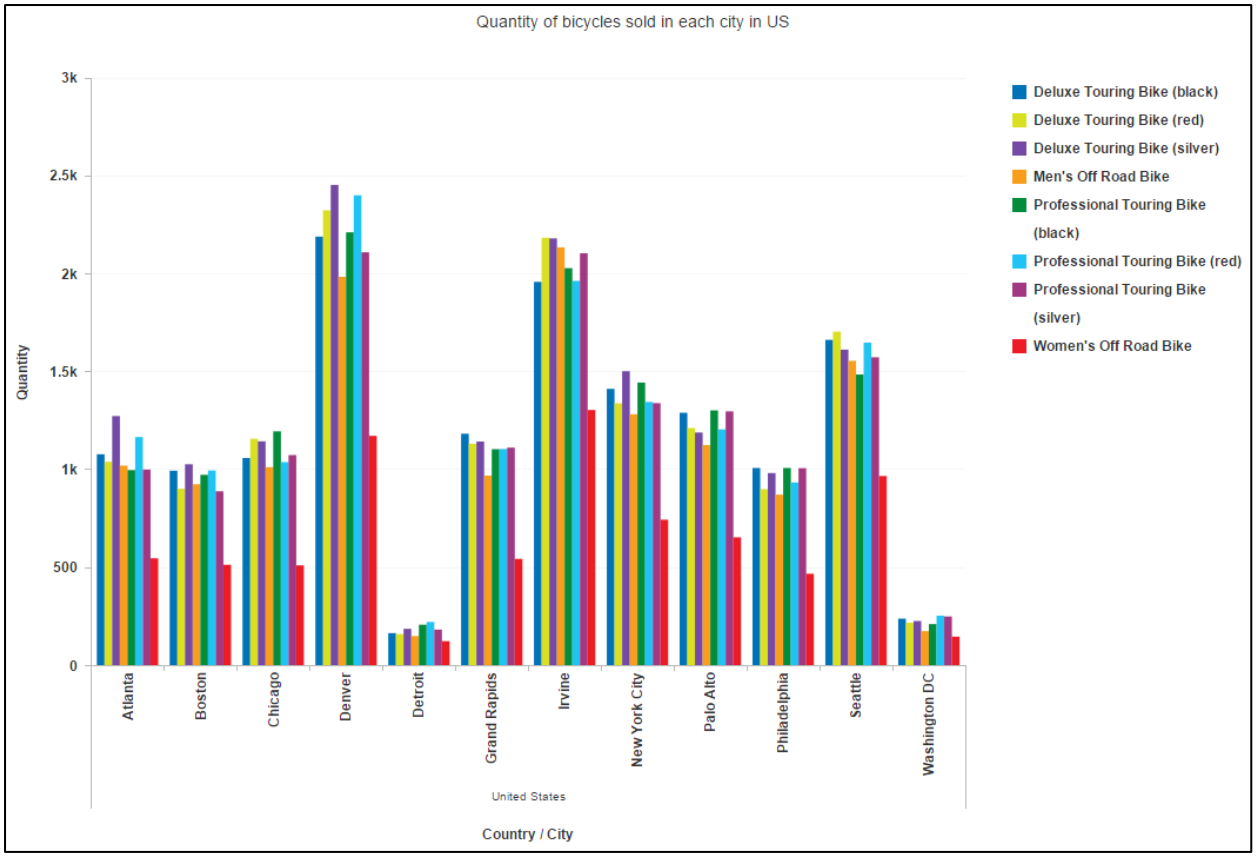

Figure 3.7: Yearly bicycle sales quantity of each model in US city

Based on Figure 3.7, it is observed in overall, the trend of sales performance of WORB is lower as compared to other bicycle models. In addition, this phenomenon is observed in every city. This concludes that the low sales performance of WORB is not due to the sales location. Figure 3.8 shows the average unit cost in US dollar of each bicycle model in US.

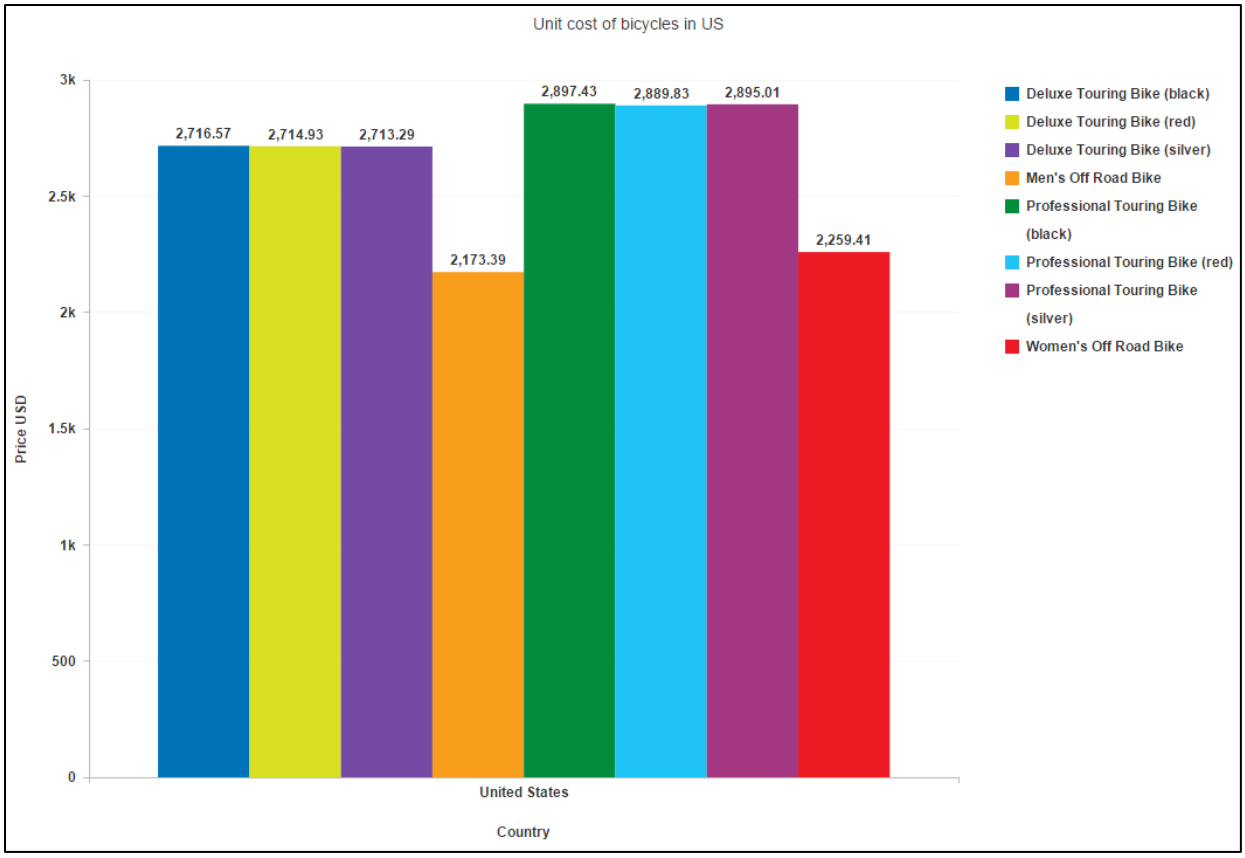

Figure 3.8: Unit cost of each bicycle model in US

Based on Figure 3.8, it is observed that the price of off-road bike model is generally less expensive as compared to touring bike model. The unit cost of WORB is just slightly more expensive than men's off-road bike. However, based on previous observations, sales performance of men's off-road bike is similar to touring bike, but sales performance of WORB is observed to be significantly less. This concludes that price may not be the factor inhibiting the sales performance of WORB. Figure 3.9 shows the sales quantity of each bicycle model in each quarter in US for year 2006 to year 2009 while Figure 3.10 is a continuation which shows from year 2010 to year 2013.

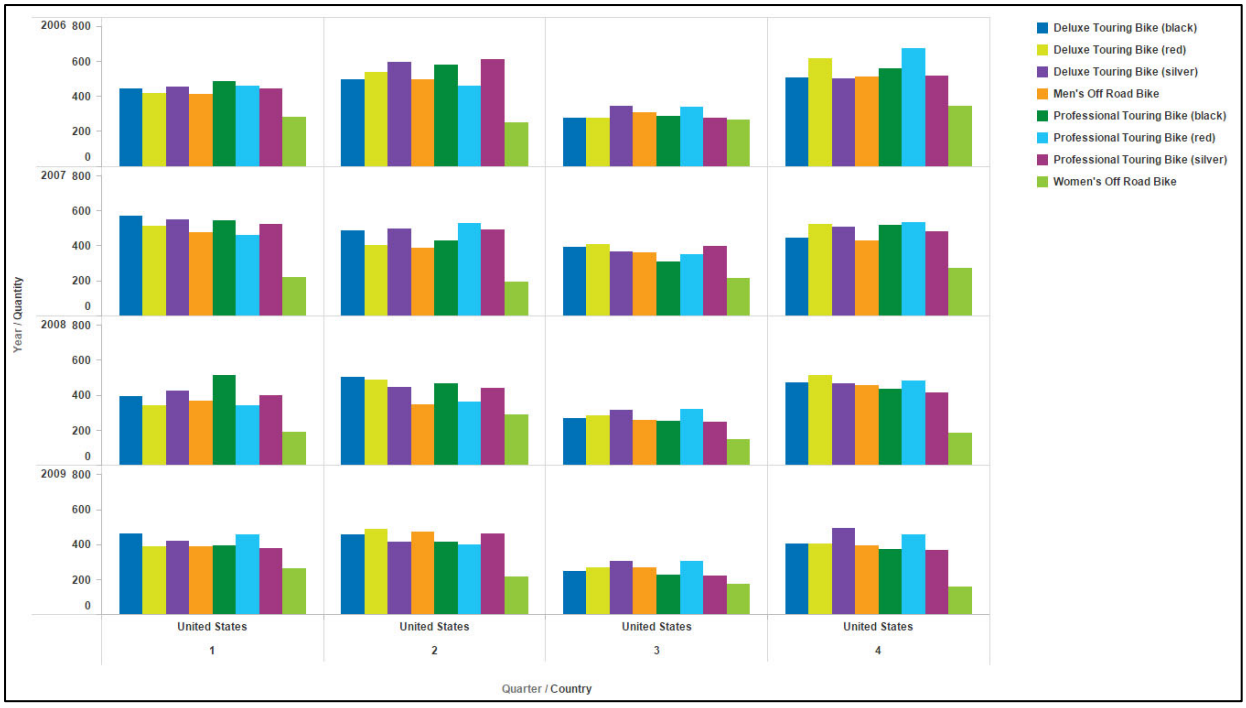

Figure 3.9: Sales quantity of each model in each quarter (Part 1)

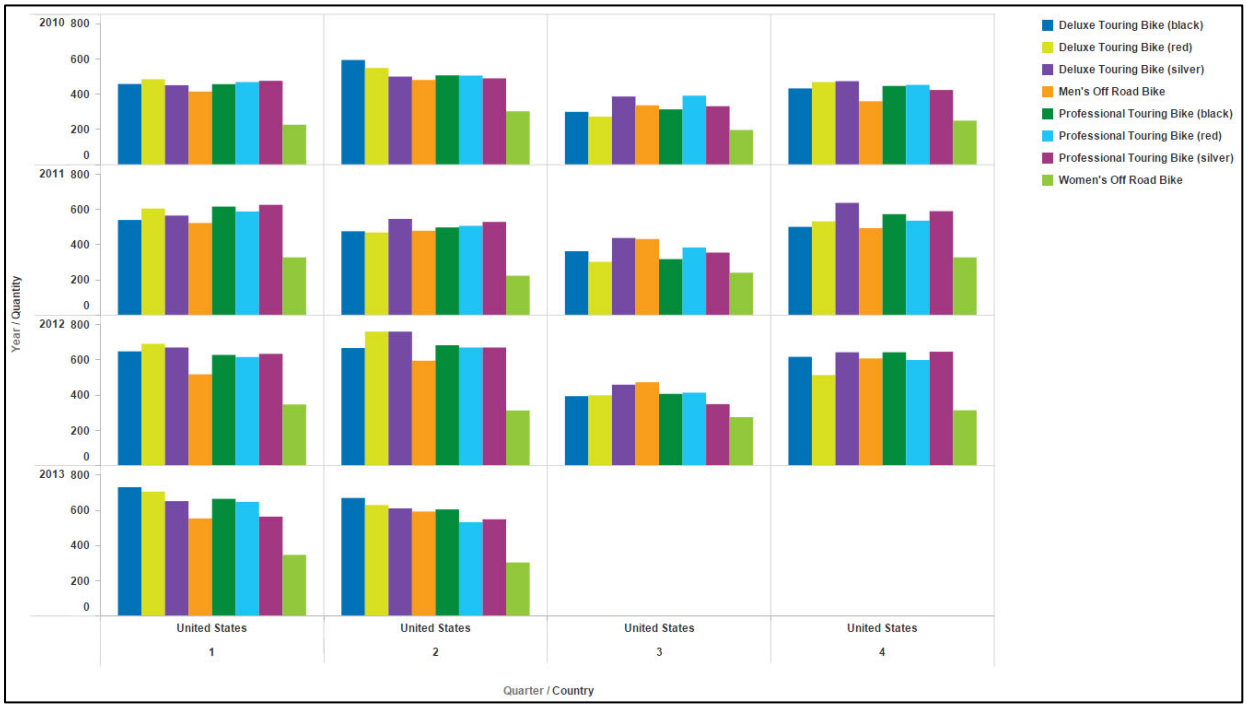

Figure 3.10: Sales quantity of each model in each quarter (Part 2)

Based on Figure 3.9 and Figure 3.10, the sales performance of WORB is observed to be consistently lower than other bicycle models throughout each quarter of the year. In addition, this

trend is observed in every year. This concludes that the low sales performance of WORB is not due to product seasonality issue.

Based on the above analysis conducted, the WORB has been observing low sales performance as compared to other bicycle models throughout the years. It was concluded that pricing is not the cause for low sales performance since the price of WORB is not exceptionally more expensive than other models. In addition, product seasonality is also not the cause of low sales performance as analysis conducted to observed sales performance in every quarter showed that WORB exhibits same results of lower sales performance as compared to other models. Furthermore, product sales location is not the cause of low sales performance as investigation into each city shows the same results where WORB exhibits lower sales performance as compared to other models.

Further investigation is required particularly towards the external data sources to identify the possible cause of low sales performance of WORB. As the data analysis has identified that seasonality, pricing, and location is not the issue causing WORB to have low sales performance in US.

3.2 INFORMATION ANALYSIS

This section documents the mining and analysis of external data which are targeted to identify reasons for low sales performance of WORB.

The mountain biking community has always been male dominated (Abbott, 2017). In addition, marketing campaigns in off-road bikes are typically targeted towards the male audiences which provide less relation of the sport towards female audiences. Furthermore, the lack of aspiration from female role models in this sport can lead to lower women participation. However, speaking from experience, Abbott (2017) has observed an increase in female participation in the sport when the formation of ladies-only mountain bike riding groups, skills clinics, clubs, and blogs are provided to encourage female riders. It was also mentioned the fear in starting to ride as there was no female supports provided in the male dominated sport. Therefore, providing programs specifically targeted towards female riders would significantly attracts ridership as women tend to learn better from women.

Similarly from Burling (2020), the reasons behind lower female ridership in off-road biking is due to the over-emphasize of danger and risk in the sport. In addition, media portraying the ideology of masculinity in the sport deterring the participation from women. Furthermore, in a mixed-gender bicycle camp, the females felt more intimidated and burdened by the males that have ridden for longer period and identifying themselves as more advanced riders. Therefore, as per the author, risk associated with the sport and intimidation is the main reason why so few women venture into the sport.

A survey was conducted by Boucher (2016) to investigate the reasons for low female ridership. The survey counted almost four male bikers to every one female biker. The main response identified from the survey on female riders are feeling intimidated and unsafe. The study found that women are more risk aware and oppose to joining the sport as there were a lack of adequate safety infrastructure provided in off-road biking. Therefore, improving the infrastructure may encourage higher female ridership.

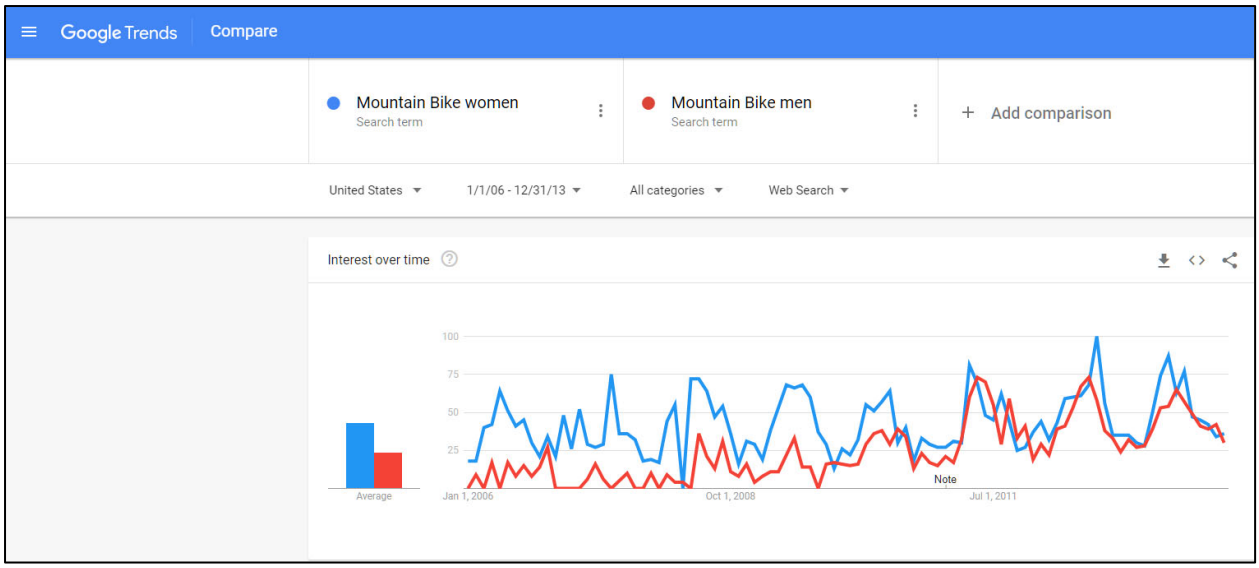

Figure 3.11: Google search trend for mountain bike in US (Google Trend, 2022)

Figure 3.11 shows a web search trend using Google Trends for mountain bikes in US from year 2006 to year 2013 and segmented by the male and female mountain bike searches (Google Trend, 2022). It was observed that on average, there is a higher web search about the female mountain bike as compared to the male mountain bike. This may indicate an interest in the off-road biking

sports in the female audience. Which the previous evidence suggests, there is a lack in female support in the community thus the female audience might be searching online to identify any female rider communities.

A mountain biking event specifically for women is held at BikePark Wales, which has attracted a high turnout of women riders (Glass, 2016). On an ordinary day, the park would receive at most 5% of female riders. Thus, the event has shown the high interest in female riders in off-road biking sports. The event provided a sale of wide selection of women biking clothes which many consumers commented that it is difficult to find biking gears specific to women in their local bike shops. In addition, women find such events less intimidating and more relaxed since the event specific to women tend to be more supportive and more sociable as compared to a mixed gender event. It is suggested that segmenting the biking events into different levels to accommodate women who are less skilled in the sports which women find that it is easier to blend into groups with similar ability level which encourages the liking of the sport.

Furthermore, coaching session specifically for women is found to be of high impact in attracting female ridership as the environment encouraged the rider by providing support from other women in the field. Such sessions were very popular and were fully booked. However, few of the women commented that information about when and where such events were held were not reaching out to the women effectively while many did not get notified about the events.

3.3 KNOWLEDGE ANALYSIS

The literature survey of case studies where business intelligence is applied in the bicycle industry is performed. The findings are tabulated in Table 3.1 which documents the business intelligence solutions adopted by each company to achieve different objectives.

Table 3.1: Literature survey matrix

Reference	Problem	Aim	Solution	Result	Remarks
Reid (2021)	Paper waiver filled by customer for test riding bikes are to be entered into the system for follow up purpose, but employees are often busy and forget to input into the system.	To streamline the waiver form filling process and increase follow up with customers.	- A kiosk with Jotform application for customers to fill in the waiver is implemented in every store.	- Improved in-store sales - Provided an organized view and database of waiver forms for follow up	The use of tools and technologies automated the work process to allow employees to better manage their workload and time.
Sorenson (2021)	Surge in bicycle demand is observed during the pandemic. However, post pandemic market has observed a general decline in bike sales in United States.	To identify solution to maintain bike sales in the post pandemic market.	- Careful planning and management on the supply of bikes into the market - Impose new product development	- Proposal to improve bicycle sales, no implementation	Undersupply of bikes will stifle interest, while oversupply of bikes may result in poor retail margin.

Reference	Problem	Aim	Solution	Result	Remarks
gyiernahfufieland (2021)	Profit and revenue in GBI Germany are much lower than GBI United States. Comparing the data from year 2013 to 2020.	To propose strategies to improve net profit of GBI Germany.	- Strategy 1: Sales visit to customer that has stopped buying from GBI - Strategy 2: Convert to serve Direct-to-consumer market - Strategy 3: Impose new product development	- Proposal to improve net profit, no implementation	Conducted descriptive and diagnostic analysis to identify the root cause of low profit and found that Tour de France and Tour de Germany has been on hold from year 2008 to 2017 and the COVID-19 lockdown has caused many races to postpone and cancelled. Hence, the drop in sales.
Simplity (2020)	The company has recorded ERP data but does not have any implementation to utilize the data. The company would like to utilize the data to better understand customer behavior and achieve higher customer retention.	To use the available ERP data to perform analytics and improve company sales revenue.	- Performed market basket analysis to discover customer purchase patterns - Performed association rules to identify products that are purchased together frequently - Implement the findings into a recommender system in the online shop	- The new tools implemented provided an improved online purchase experience due to the targeted promotions and offers - Higher sales revenue is recorded	The project took one month to implement, and results are seen quickly where higher return are observed and provided improved benefits for the company.

Reference	Problem	Aim	Solution	Result	Remarks
Bicycle Retailer and Industry News (2020)	Very limited data is available about the biking industry and timeliness of reporting such data is lagging.	To help supplier perform inventory forecasting and improve sales margin.	- Performed surveys to collect data from the biking community - Developed a dashboard showing daily and weekly information about ridership, retail sales, and consumer attitudes	- The daily and weekly snapshot provided insights to new market trend and customer behavior - Improved e-commerce sales between 50% to 100%	Dashboard complementing with in-depth reports allow quick and informed decisions to be made.
Vertex Marketing Agency (2020)	The company website is not getting traffic and the interface is not user friendly.	To improve sales via increased online presence.	- Performed website audit and provide improvement on the visuals and optimization on user interface - Performed search engine optimization - Implemented Google Ads	- Significant increase in traffic to the website - Improved sales revenue - Optimized work operation flow	Improving website user interface increases the attraction of traffic to the website.
nosto (2020)	Customer unaware of services provided by the company and often create confusion resulting in extra time spent in consulting the customer service.	To improve sales and provide the right products to the right customers based on their needs.	- Performed customer segmentation to develop personalized plans and information for the customer groups - Performed A/B testing and optimization on the product webpage	- Customers are better informed about the products and services provided - Improved click-through-rate on product webpage by 76%	User experience in navigating through the website, leaves an impression of how good the service is provided by the company.

Reference	Problem	Aim	Solution	Result	Remarks
Morley (2020)	Difficulty in data accessibility as it was held in operational and legacy systems.	To use data assets as the key to improve day-to-day management and a platform for medium to long term planning.	- Dashboards are developed to monitor business and guide decision making - Implementation of analytic models in product analysis, supplier analysis, telephone analytics, and customer analysis	- Saved 1.5 workdays per week in report preparation - Self-service analytics provided managers to data-driven decisions	Data were integrated from multiple sources which involved finance, customer resource management, rental management, telephone, and e-commerce applications.
Voidonicolas (2020)	The company is committed to in-store experience and have no online platform for long distance customers to finalize their purchase.	To capture more sales through the implementation of an online platform.	- Adopted Shopify web platform to host their e-commerce website - Implemented Shopify point-of-sale system which unified the business management of their physical and online stores	- Online sales doubled in six months - Sales cycle reduced from four weeks to one week - Brand awareness improved	Synchronization between digital and physical experience would significantly improve sales and customer experience.
BlueConic (2020)	Reduction in sales due to COVID-19 and relied only on dealers to distribute products.	To accelerate digital transformation and adopt a data-driven approach to improve sales.	- Implemented customer segmentation analytics to provide targeted advertisement and personalized services - Implemented an e-commerce website to increase brand exposure	- A 10% to 15% increase in revenue - Better inventory management based on market trends to cater needs of customer	Quick decision making and new strategies implementation saved the company from shutting down due to the reduced sales caused by lockdown of COVID-19.

Reference	Problem	Aim	Solution	Result	Remarks
Acquire (2019)	Customer support channel was limited to email and phone with over 1000 customers enquire daily. The channels are insufficient in handling customer support efficiently and effectively.	To implement an effortless customer experience through additional communication channel for providing customer support.	- Implementing live chat interface on website to allow customers to enquire on products and services	- Achieved a near 90% live chat response rate - Identified the commonly enquired issues and implemented in product design consideration - Improved customer satisfaction	Providing a seamless customer experience can significantly improve sales revenue and improve customer satisfaction. The customers are likely to recommend the product to others.
HubSpot (2018)	The customer service portal of the company is insufficient to cater for the increased demand	To optimize customer service portal to cater for growth of company.	- Implemented an online communication platform that uses a ticketing system to allow customers to fill out forms for enquiries and issues - Simple questions that require short replies are performed through chat bots - Complex questions will be handled by the team	- The recorded conversations allowed the company to analyze and discover customer behavior and purchase pattern - The communication platform streamlined the customer service process and improved customer experience	The communication platform eased up time and allowed the company to spend more time on research and development of product.

Reference	Problem	Aim	Solution	Result	Remarks
InfoCepts (2018)	No reports to assist the executives in quick decision making. In addition, the rate of returning customers is very low.	To increase revenue and identify potential customers.	- Performed customer segmentation to provide targeted offers - Developed multiple dashboards to monitor sales progress and reasons why customers are not buying	- Achieved 30% reduction in generating sales report - Achieved 21% increase in revenue - Achieved 50% increase in customer	Dashboards provide a quick overview of the metrics allowing the company to quickly identify trends and implement campaigns.
Hallam (2018)	The company sells its products through a network of dealers and the online sales is not performing.	To increase volume of online sales.	- Launched a new e-commerce website for the company - Performed search engine optimization and content marketing to increase traffic to the website of the company	- The company achieved a 676% increase in revenue through e-commerce - Company brand now ranks on page one on google search	Exposure of the company in market is important to attract more customers.
Kustomer (2018)	The company is growing, and the vast amount of customer data collected is not effectively utilized.	To implement a fully integrated customer management platform to obtain an overview on the questions from the customer.	- Implementing dashboards about customer behavior and market trends - Implementing an integrated platform for providing customer service in multiple social platform	- Increase customer satisfaction - Reduced case handling time - Better product design as per requirements from customers - Faster reaction to market condition	The consolidation of customer data allowed quick decision to be made and provided a deeper understanding on the needs of the customer.

Based on Table 3.1, majority of companies are implementing business intelligence to improve either revenue or customer experience. The common issues faced by the companies are ineffective and inefficient work operations to cater for the increased demand as the companies are growing. Therefore, the companies would like to implement approaches to streamline operations and improve work capacity. Various approaches have been mentioned to be implemented to improve the revenue generation and improve customer experience. It is very dependent on the objectives and resources available from the companies to develop a tailored approach to achieve the objectives specified by the companies. Such approaches observed are implementation of dashboards, implementation of integrated platforms to unify and streamline customer service, and performing customer analytics to provide personalized experience. Nevertheless, all companies are observing improved revenue generation and improved customer experience after adopting business intelligence approaches.

SECTION 4

CRITICAL ANALYSIS

Based on the analysis on the organizational memory, it was found that sales performance of WORB in US is lower as compared to other bicycle models. Investigation into the data found that pricing, seasonality, and location of sales did not provide impact to the sales performance of WORB.

The average unit price of WORB did not significantly differ from the unit price of men's off-road bike. However, it was observed that sales performance of men's off-road bike is significantly higher than WORB. This trend was observed throughout the bike shops which GBI supplied to in US. In which this would eliminate the reason of sales location causing the weak sales performance. In addition, the weak sales performance was observed since the start and maintained the same trend throughout the data timeline. This would indicate that product seasonality does not provide impact the sales performance of WORB. Since the reason causing low sales performance of WORB could not be identified through the data, this may indicate the underlying problem may be caused by external factors.

Based on information analysis, several reasons are identified which can be linked to the low sales performance of WORB. Main reason being feeling intimidated as there is a very low number of female ridership as compared to male ridership in off-road biking. In addition, females felt that infrastructure in off-road trails does not provide sufficient safety. Furthermore, the lack of notification and setting up women's only events to encourage and educate female ridership. Lastly, the supply of variety of biking gear specific to women is insufficient to meet the demand of the women biking groups.

Generally, the off-road biking sport is perceived as a male dominated and dangerous sport which can lead to serious injuries. Therefore, the sport did not immediately attract huge numbers of female bikers. The main reason for low female ridership is the feeling of intimidation in joining the sport where majority of riders are male riders. There is an insufficient of female role models to guide the beginners to venture into the sport. As women to women communication is far more

effective as compared to male to women communication. As there are differences in communication style between gender. Women would feel more comfortable and more supportive when communicating with other women. This allows the environment to be supportive and not become competitive which encourages the participation of female into the sport.

Off-road biking is perceived to be a dangerous sport where bikes would generally be ridden on mountain trails or unpaved surfaces which require certain knowledge and skills in biking to ensure the safety of the rider when performing the sport. Biking infrastructure especially the condition of the trails plays an important role in encouraging female riders as better infrastructure with higher safety standard would attract higher female ridership. As female is more risk aware as compared to male. Therefore, setting up biking clinics specific to women's only would strongly encourage and educate the female riders to participate as they would feel more comfortable when they are guided by another female.

Increasing the number of women's only events in the biking community is highly encouraged as it can attract a high number of female riders to the events. Which would provide and encourage more beginner riders into the sport. In addition, such events provide the opportunities for women to purchase women's specific biking gear as there is always a lack in choices provided by their local bike shops. Furthermore, such events should be marketed to reach more audiences as many female riders had mentioned that they are not aware of such events organized.

The use of social media to promote such events are very effective which can unite the local biking community to encourage the participation of female riders. Beginner female riders would tend to prefer to ride along with other female riders instead of male riders. This is due to the differences in strength and risk appetite observed between genders. Where female riders are likely to have lower strength and risk appetite which would prefer to ride along easier trail. The mix of riders in terms of gender would instill burden and fear in the female riders as they are not able to catch up with the male riders.

Based on knowledge analysis, there exist two main problems which the bicycle companies are trying to solve namely improving revenue and improving customer experience. All companies are adopting business intelligence in trying to solve their problems.

A variety of solutions are proposed by their business intelligence consultant. Mainly by adopting big data tools and technologies to optimize their day-to-day operations achieving higher work efficiency. In addition, the importance to improve user experience of the company website has shown great impact in attracting higher traffic.

Dashboards are observed to be implemented in few of the companies which provided quick and easy access to certain business metrics which guided the decision making of their executives and shorten the time needed in preparation of reports. This allowed companies to quickly adapt the market situation and apply the right marketing tools to capture the target audiences effectively and efficiently. In addition, big data analytics are utilized in few of the companies to achieve a deeper understanding into the needs of their customers. This allowed companies to develop personalized offer to their customers thus increasing the customer retaining rate while improving the customer satisfaction.

The improvement made to the websites of the companies has attracted higher traffic to their online stores. A seamless user interface on the company website would provide a good impression for the consumers towards the company. As consumers would associate the user experience with the quality of service provided by the company. The implementation to allow products to be purchased online has attracted consumers from different regions which increased the customer pool. As mentioned, the female riders are dissatisfied by the limited selection of women's specific biking products in their local bike shops.

The investment made by the companies in adopting business intelligence have all observed positive returns. Therefore, indicating the benefits of business intelligence. However, companies would have to consider the potential return, costing, and availability of existing resources before venturing into the adoption.

SECTION 5

FINAL DELIVERABLES

This section outlines the recommendations that should be adopted by GBI to increase the sales performance of WORB. The formulation of the recommendations would be based on the analyses conducted from the previous sections. The formulated recommendations are as followed:

Recommendation 1: Organize more women's only biking events

It is observed that women's only biking events such as bike clinics and bikers meet up has a high turnout rate of women riders. By organizing more women's only biking events, this would encourage new female riders into the sport which would help to grow the female biking community. In which an increased in number of riders would translate to an increase in demand of bicycle purchase. Implementation of this recommendation does not yield immediate results. However, it would provide GBI an increase in company exposure as the events would carry the GBI brand which would indirectly increase sales in other products. Eventually in the future, as the female biking community is established it would provide an impact to GBI sales performance.

Recommendation 2: Encourage the employment of female staffs

Different communication style is observed between men and women. Women to women communication is identified to be much more effective as compared to men to women communication. Employment of female staff would provide a more comfortable environment for female consumers to approach the bike shops. In which the female staff would be more patience and understanding towards the needs of female consumers. This would result in an increased female customer experience and likely increase the rate of closing a deal. However, since GBI is selling their products through dealers, GBI can offer the recommendation to the dealers and educate about the potential impact in revenue when employing female staffs.

Recommendation 3: Active in media posting about women's off-road biking

Social media are widely used by female bikers to identify biking communities and events. Encouraging GBI to engage in online media posting regarding women's only events, technical

information about biking, and sharing of female off-road biking experience would significantly attract more female ridership. This would allow females to perceive that the sport is approachable and not be intimidated by the societal norms. In addition, GBI can utilize social media to post and organize communities for female bikers which would unite the local bikers and form a comfortable environment to attract new ridership. The increase in female ridership would translate to an increase in demand for WORB.

Recommendation 4: Design and develop women's specific biking gear

It was commented by female riders that their local bike shops offered a very limited selection of biking gears personalized for female riders. GBI can consider designing and developing women's specific biking gear by conducting survey on the requirements from women bikers to develop a range of products that would fit the taste of the audience. In addition, the finished products can be marketed online on GBI website and provide online purchase option. Which would attract a higher traffic to GBI website from various regions in US and would lead to increasing company exposure. The availability of wide selections of women's specific biking gears would attract more female riders into the sport which would eventually increase the demand for bicycles.

SECTION 6

CONCLUSION

An investigation into the reasons of low sales performance of WORB is conducted. The investigation started by exploring the organizational memory and found that the low sales performance of WORB is only observed in the US region. It was identified that from the organizational memory, insufficient evidence can be concluded to identify the cause of the low sales performance. Therefore, investigation into the external factors is conducted.

Several reasons are identified from external factors that may contribute to the low sales performance of WORB. In general, the number of female off-road ridership is found to be lower than the male off-road ridership. This is due to the intimidation felt by females when approaching the sport which is deemed as male-dominated and extreme in nature. Therefore, a lower number of new ridership are observed from females. In addition, another reason is the lack of women's only biking events which such events are popular among female riders and could encourage new ridership. Furthermore, the lack of women's specific biking gears has led to the dissatisfaction of female bikers which may discourage the bikers or new riders to stay in or join the sport.

Based on the external factors, several recommendations were formulated to GBI. In which the recommendations are focused on empowering the female riders and tries to encourage more female ridership into the sport. The increase in ridership would induce the demand for bicycles which would drive up sales. The recommendations would include organizing women's only events, employment of female staffs, social media postings about female empowerment, and developing a range of women's specific biking gears. However, the implementations will not provide immediate return in results but would first develop the female audiences in the sports and eventually increasing the demand for WORB.

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