



## **Business Intelligence System Case Study on the Sales Performance of Global Bicycle Inc.**

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## 1. Introduction

The purpose of this report is to identify the business problems related to the sales performance of a company and investigate strategies to overcome them. It is accomplished through the methodical application of Business Intelligence techniques, by analyzing the sales department data of that company. It begins by examining the organization's memory and integration of the company's data. Then to conduct Critical Data, Information and Knowledge Analysis. Based on the analysis outcomes, it provides recommendations to improve the sales performance.

### 1.a Company Background

Global Bike Inc. (GBI) is a business entity selling bicycles. The creation of GBI is based to the merger of two distinct entities, a bicycle company named “Heidelberg Composites” founded by an Engineer, Peter Schwarz and a mountain bike company called “Frankenstein Bikes” founded by John Davis, a renowned cyclist and mountain racing champion.

The vision of GBI is to become a world class bicycle company that serves professionals and consumers in the field of travel and off-road racing. The mission is to focus on development of high quality and performance bicycles.

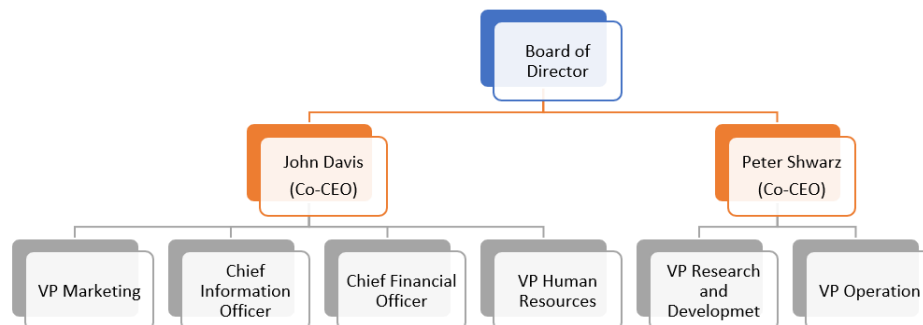


Chart 1 Global Bike Organizational Structure

Chart 1 illustrates the GBI organizational structure. John and Peter are the co-founders of GBI. John is mainly in charge of the organizational income, marketing, finance, human resources, and marketing while research and development, and operation are under Peter care.

## 1.b Corporate Overview

Global Bike Inc. (GBI) has dual headquarters, with one located in the United States and the other situated in Germany. The United States is geographically divided into distinct West and East regions. While Germany divided into North and South regions.

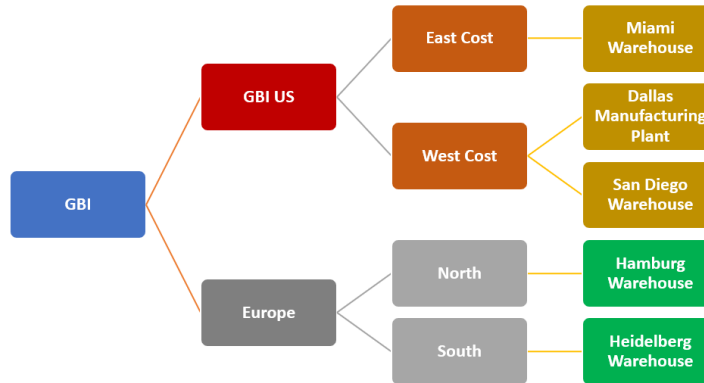


Chart 2 Global Bike Inc Business Structure

Chart 2 illustrates the GBI Business Structure. The company's headquarters is situated in Dallas, registered as a US entity, and follows US Generally Accepted Accounting Principles (GAAP) requirements. The headquarters for Germany is situated in Heidelberg. It adheres to the International Financial Reporting Standards (IFRS) and abides by German tax regulations.

## 1.c Product Strategy

GBI is a world class high quality and high-end racing bicycle, and accessories cater for pro consumer cyclists. GBI signature composite frames are known worldwide for its durability, strength, lightweight and ease of maintenance. The brand has been synonym for major international road races including Le Tour De France and other major international road races.

Bicycle	Safety Gear
Deluxe Touring Bike (black)	Air Pump
Deluxe Touring Bike (red)	Elbow Pads
Deluxe Touring Bike (silver)	First Aid Kit
Men's Off Road Bike	Knee Pads
Professional Touring Bike (black)	Off Road Helmet
Professional Touring Bike (red)	Repair Kit
Professional Touring Bike (silver)	Road Helmet
Women's Off Road Bike	T-shirt
	Water Bottle
	Water Bottle Cage

Table 1 GBI main products and accessories

The main product of GBI is a deluxe and professional touring model and divided into three variances of colors. Each segment varies in size and form. In addition, GBI also has a safety gear collection. Table 1 illustrates GBI products and accessories.

### 1.d Distribution and partner Network

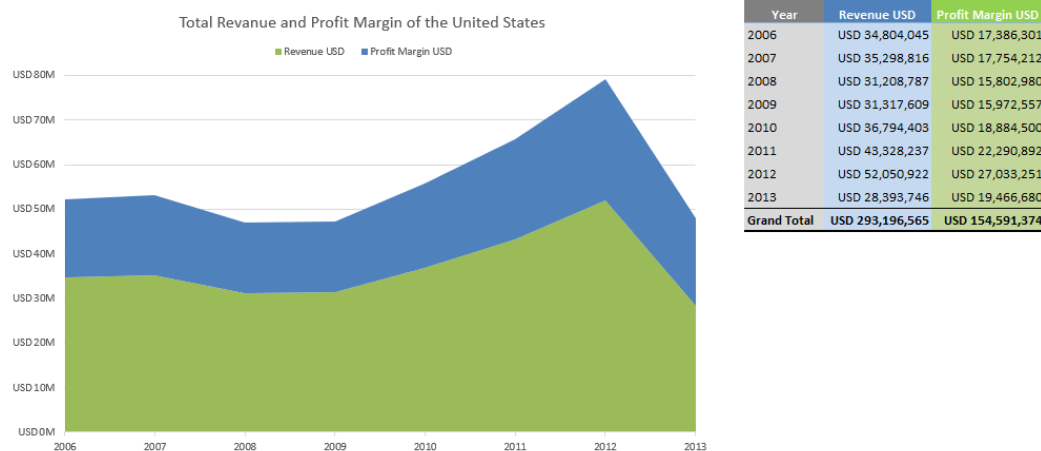
GBI sells its products to only reputable and well-known independent bicycle dealers known as IBDs. These retailers are professional in their segments such as off-road and tour racing specialized to assist customers making decisions of selecting bikes based on their needs.

United States	Germany
Beantown Bikes	Airport Bikes
Big Apple Bikes	Alster Cycling
DC Bikes	Bavaria Bikes
Furniture City Bikes	Capital Bikes
Motown Bikes	Cruiser Bikes
Northwest Bikes	Drahtesel
Peach Tree Bikes	Fahrpott
Philly Bikes	Neckarad
Rocky Mountain Bikes	Ostseerad
Silicon Valley Bikes	Radleland
Socal Bikes	Red Light Bikes
Windy City Bikes	Velodom

Table 2 list of GBI retailers

GBI embraces the Internet as an information channel to educate consumers and partners and a marketing tool advertising its products. However, the revenue from the internet is relatively small due to the main sales source being from the professional retailers. Table below 2 shows the list of retailers in the US and Germany.

### 1.e Problem Statement



Graph 1 Total Revenue and Profit Margin of The United States

Based on the preliminary data analysis results, the revenue and profit margin in the United States reveals a notable pattern in the figure's area chart, indicating an upward trend until 2012 except for the year 2008 and 2009 which it was recorded the lowest revenue and profit margins for GBI. According to the accompanying table, the revenue and profit margin in 2008 amounted to approximately USD 31.21 million and USD 15.80 million respectively, marking the lowest point when compared to the preceding and subsequent years.

Another noticeable finding, as for the 2013 data, it was recorded only for the first half of the year. Therefore, it is not directly comparable with the performance of previous years. However, a closer look at the revenue data, the performance for the second quarter of 2013 (USD 13.58 million) was lesser than of 2012 (USD 15.13 million). This could be a potential early signal for the company to address.

### **1.f Objectives**

This report aims to provide a thorough examination of the events that occurred during the indicated years. Moreover, it aims to offer answers and suggestions that are intended to improve GBI's sales revenue and profit margins in the United States. These recommendations are derived from a thorough examination of historical data, information, and knowledge acquired from several sources.

The objectives of this paper are:

1. Analyzing data collected from both internal and external sources to obtain a thorough comprehension of the aspects that impact GBI's sales performance and profit margin trends in the United States market during the reference period.
2. Strategic Recommendations: The aim is to offer practical and effective suggestions to tackle the highlighted issues and take advantage of possibilities, with the ultimate objective of improving GBI's sales performance and profit margin in the United States market.

## **2. Organizational Memory**

Organizational memory is a storage of acquired knowledge in the course of an organization's existence that accumulated over time (Bhandary & Maslach, 2016). It consists of acquisition, retention and retrieval of information that help organizations make better decisions and reduce GBI operation cost (Sabherwal & Becerra-Fernandez, 2011).

The GBI has diverse operations consisting of Sales, Marketing, Service and Support, IT, Finance, and Human Resources, alongside Research, Design, Procurement, and Manufacturing Groups across the region. Hence, this accumulated knowledge of information requires a robust data storage solution to manage its complexity and huge volume of data effectively.

### **2.a Data Storage**

The data storage infrastructure at GBI is a critical component of the company's IT infrastructure. It ensures the security and accessibility of transactional records, customer information, inventory levels, and historical data. Given GBI's extensive operations, the data storage solutions must be highly reliable and scalable. For this purpose, it is best to consider the OLTP as a database solution, as elaborated below.

### **2.b Online Transaction Processing (OLTP)**

OLTP systems handle GBI's day-to-day operations to manage and process high volumes of short, atomic transactions generated by routine business activities such as sales orders, inventory updates, and customer interactions.

OLTP databases are optimized for transactional integrity and speed, ensuring that data is processed efficiently and accurately in real-time without delay and with minimal risk of error.

In 2009, GBI's Dallas office implemented SAP ERP (version 6.0) with OLTP capabilities to streamline ERP and centralize the organization's structures for all IT activities to lower costs and improve operational efficiency.

The adoption of SAP ERP brought about numerous advantages for GBI, including facilitated the storage of GBI data in a centralized data warehouse, significantly reducing operating costs, the elimination of data replication, inconsistencies, and redundancy. The system offers real-time updates, enhances efficiency, improves asset control, promotes consistency, reduces costs, and increases income. Furthermore, it enhances HR management and consumer communication, thereby supporting GBI's global operations effectively.

## 2.c Data Integration

Data integration refers to the process of bringing together data from multiple sources across an organization to provide a complete, accurate analysis (QlikTech International AB, 2024). System integration, on the other hand, involves the interconnection of various IT systems, software applications, and services (Yasar, 2022).

The objective of data integration is to enable system and data components to function together facilitating a unified system seamlessly. This type of integration is vital for GBI to ensure that all its IT systems work together efficiently.

Enterprise Resource Planning (ERP) version 6.0 adopted by GBI has data integration capabilities of modern business systems. ERP software includes robust data management solutions and full-scale infrastructure integration (Hayes, 2024). For GBI, an integrated ERP system means that structured data from various sources is managed within a single application, allowing for seamless data flow and informed decision-making.

## 2.d Data Preparation and Data Understanding

Customer Master	Material Master	Sales Master
General Information Company Code Sales Area Sales Organization	Basic Data Sales Data Purchasing Data Storage Data Quality Data Accounting Data	Prices USD / EURO Surcharges Discount Taxes

Table 3 Master Data in GBI



According to table 3, Master data (OLTP) in GBI consists of Customer Master, Material Master, and Sales Master. Customer Master stores information related to general information of customer, request, quotation, and payment record.

Material master data serves as a comprehensive repository containing essential information about materials. Various departments within SAP utilize this data, including sales, purchasing, materials handling, accounting, and monitoring.

The sales master data is responsible for storing a range of information, including prices, discounts, and rates. Additionally, it includes specific details related to the customer's material or other relevant information.

## **2.e Extract, Load, Transform (ETL)**

To combine data from several sources and convert it into a format appropriate for analysis or business requirements, enterprise transaction processing, or ETL is necessary. ETL stands for Extract, Transform, and Load. It is a process in data warehousing that facilitates data integration from multiple sources into a unified format for analysis and reporting (Integrate.io, 2023).

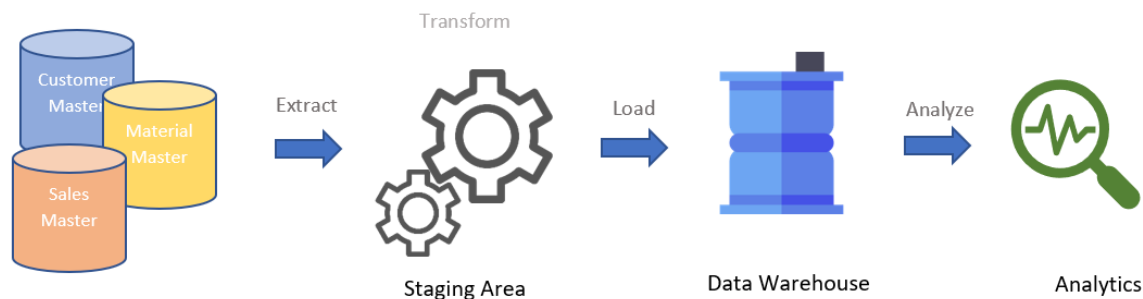
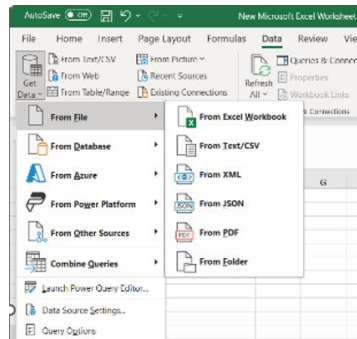


Illustration 1 ETL Process in GBI Data Warehouse - adapted from (Integrate.io, 2023)

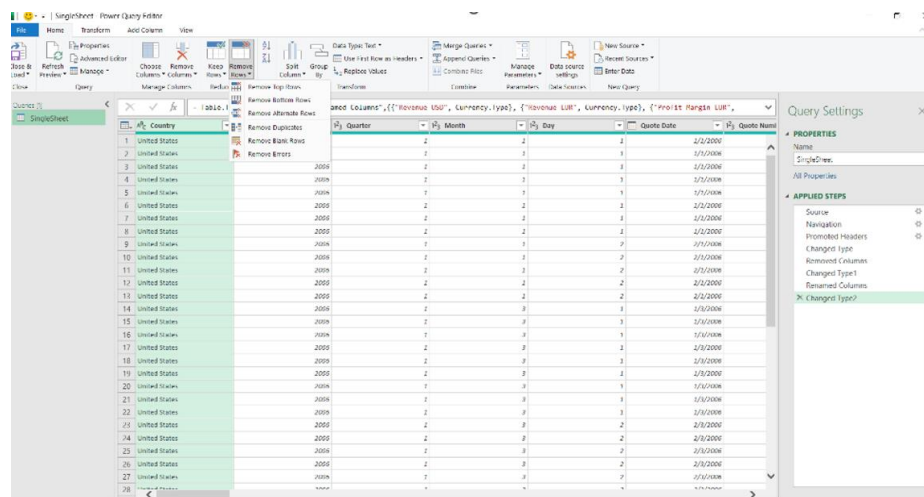
Illustration 1 explains the ETL process in GBI to consolidate data across departments and make it ready for further analysis. In this report, ETL process will be done in Microsoft Excel for example purposes.

1. **Extract:** Three masters data is imported and extracted from source systems and will be combined into one location. In Microsoft Excel, the "Get & Transform Data" are used to extract various formats of data from a specified folder then displayed in a new Excel worksheet.



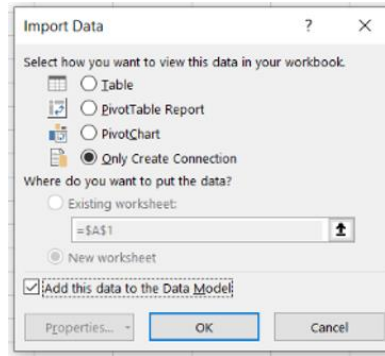
Snipped 1 Get & Transform Data

2. **Transform:** The extracted data undergoes transformation to normalize and clean it, ensuring consistency and preparing it for integration. In Excel Power Query Window, users can choose to apply advanced transformations by using formulas and functions or basic transformations such as removing duplicates, defining data types, renaming column header, etc.



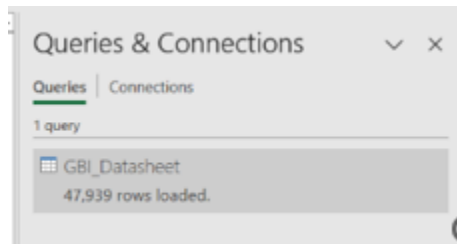
Snipped 2 Data Transformation Option

3. **Load:** The transformed data is loaded into the data warehouse or other target systems where it can be accessed for analysis. The Close & Load group in the Excel Power Query Editor can set a destination format that can be tailored to several tools such as other Excel workbooks, SQL databases, Power BI datasets, and additional formats.



Snipped 3 The Close & Load

Based on given dataset, 47,939 rows of cleaned data have been loaded successfully, with 37 dimensions and 14 measures identified in the dataset obtained as shown below.



Dimension		Measure
Layer Number	Payment Receipt Date	Quantity
Order Number	Accounting Document Number	Price USD
Layer/Order Concatenated	Customer	Price EUR
Layer-Order-Line Concatenated	Customer Name	Unit Cost at Goods Issue
Country	City	USD
Year	State	Unit Cost at Goods Issue
Quarter	Material Number	EUR
Month	Material Master Description	Discount USD
Day	Material Group	Discount EUR
Quote Date	Material Group Description	Revenue USD
Quote Number	Sales Organization	Revenue EUR
Sales Order Create Date	Sales Org Description	Cost of Goods Sold USD
Sales Order Number	Sales Area	Cost of Goods Sold EUR
Post Goods Issue Date	Sales Area Description	Profit Margin USD
Delivery Number	Division	Profit Margin EUR
Billing Date	Division Description	Exchange Rate at Quote
Billing Document Number	Distribution Channel	(USD/Euro)
	Distribution Channel Description	
	Unit of Measure	
	Currency	

Table 4 List of GBI Dataset Dimension and Measure

## 2.f Online Analytical Processing (OLTP)

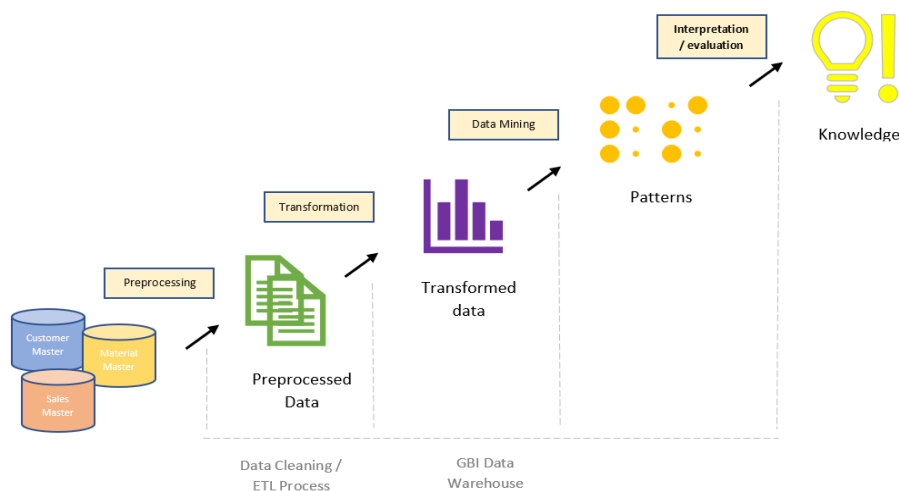
Once the data is cleaned and stored in the data warehouse, OLAP software is used to mining the data (Bhatia, 2019). OLAP stands for Online Analytical Processing, the primary usage is for data analysis, which is aimed at analyzing data to reveal hidden patterns or trends. It is not data processing which is different from the OLTP system (Sinha, 2021).

The major player in OLTP and OLAP databases is SAP HANA. It is a column-oriented architecture capable of OLTP and OLAP operation into a single platform. Hana is an in-memory database, allowing faster data retrieval and processing based on disk-based databases (Inui, 2020).

## 3. Analysis

### 3.a The Knowledge Discovery in Data (KDD)

The Knowledge Discovery in Data (KDD) process was first published by Usama Fayyad, Gregory Piatetsky-Shapiro, and Padhraic Smyth in 1996. KDD is the process of identifying valid, novel, potentially useful, and ultimately understandable patterns in data. KDD aims to extract implicit, previously unknown and potentially useful information from data stored in the database (GeeksforGeeks, 2018).



Knowledge Discovery Diagram (KDD) of GBI - adapted from (Guerra-Hernández et al., 2008)

The KDD process, as presented in (Guerra-Hernández et al., 2008) is the process of using Data Mining methods to extract what is deemed knowledge according to the specification of measures and thresholds, using a database along with any required preprocessing, sub sampling, and transformation of the database.

According to the KDD process, once the cleaned Customer Master, Material Master and Sales Master enter the GBI data warehouse, the next stage involves data mining using OLAP software to analyze and uncover hidden patterns or trends within the data (Bhatia, 2019). Finally, in the last stage of knowledge discovery, dashboards, visualizations, reports, or tables are created to represent the results of the data mining process, as outlined by (DataFlair, 2018).

Data Analysis

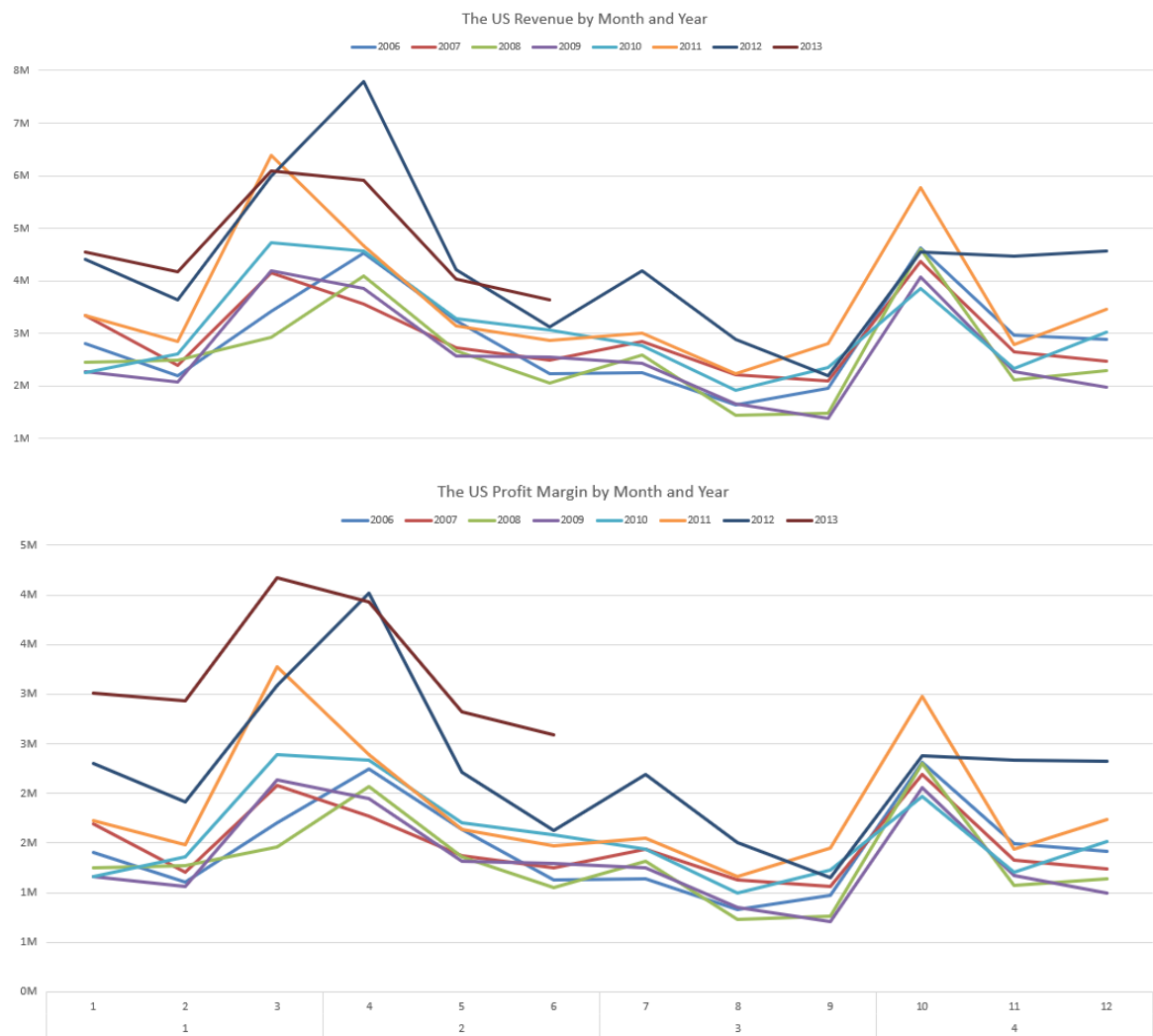


Chart 3 The US Revenue and Profit Margin by Month, Quarter and Year

Based on chart 3, the revenue shows a pattern of increase in sales early in the year from February to April, and sales re-increased again from September to October. Quarter 2 recorded the highest sales amounting to USD 86.87 million, followed by Quarter 1, USD 85.77 million. Quarter 4, USD 72.14 million. And lastly Quarter 3, USD 48.42 million.

The profit margin line is proportional to revenue obtained by GBI, showing there is a positive linear relationship between profit margin and revenue. The highest profit margin was in March 2013, where the profit margin generated was USD 4.18 million. The sales revenue was highest in April 2012. The pattern from sales revenue and profit margin indicates that there is a trend of seasonality in the US.

Another noticeable finding, as for the 2013 data, as indicated in the introduction section, it was recorded only for the first half of the year. A closer look at the revenue data, the performance for the second quarter of 2013 (USD 13.58 million) was lesser than of 2012 (USD 15.13 million). This could be a potential early signal for the company to leverage better on the seasonal changes.

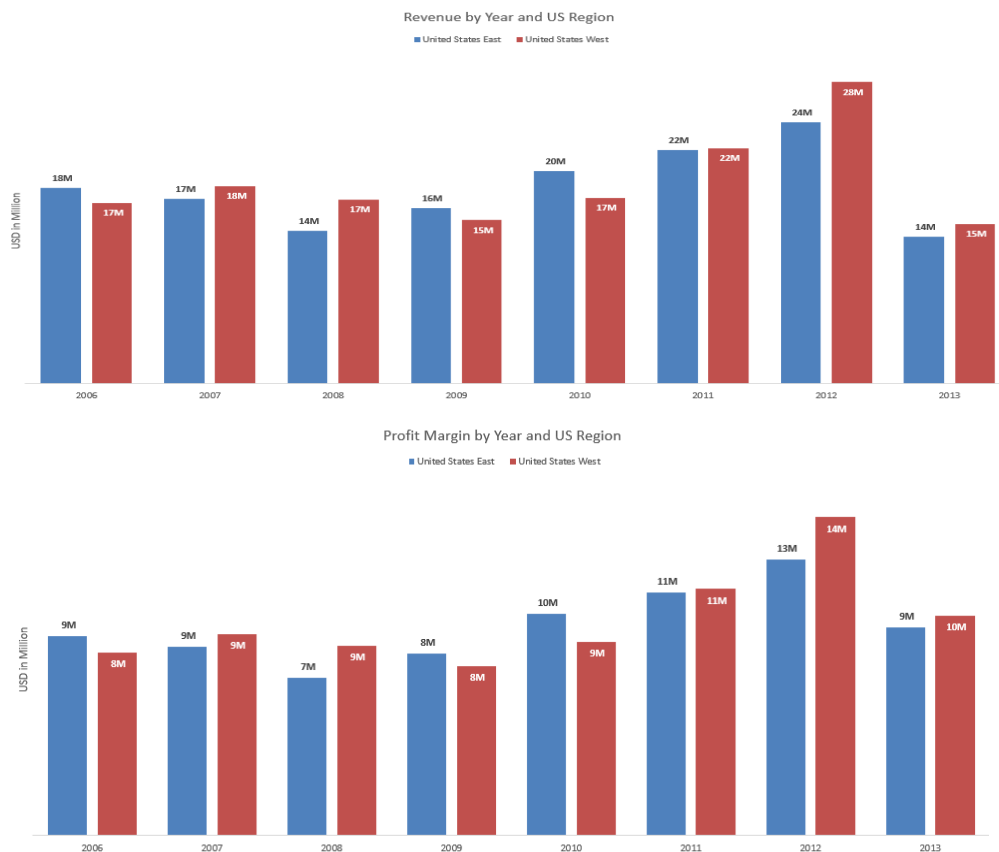


Chart 4 The US Revenue and Profit Margin by Region

Chart 4 shows there is no significant difference in United States revenue and profit margin from United States East and United States West. The trend is similar to overall revenue and profit margin in the United States where the lowest revenue was in 2008.

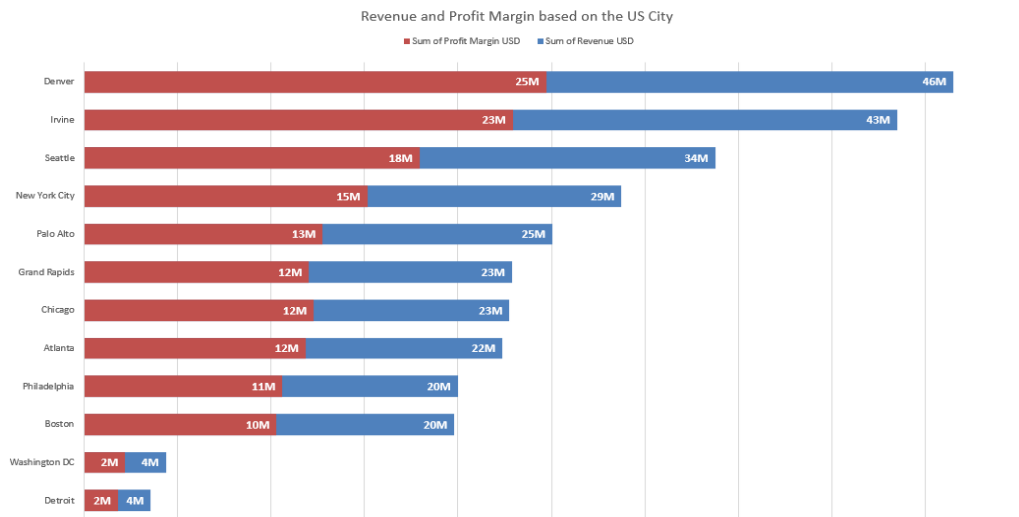


Chart 5 The US Revenue and Profit Margin by City

Chart 5 shows Denver was the highest earner with USD 46.50 million in revenue, closely followed by Irvine at USD 43.50. Profit margins reflect may vary based on the degree of financial efficiency.

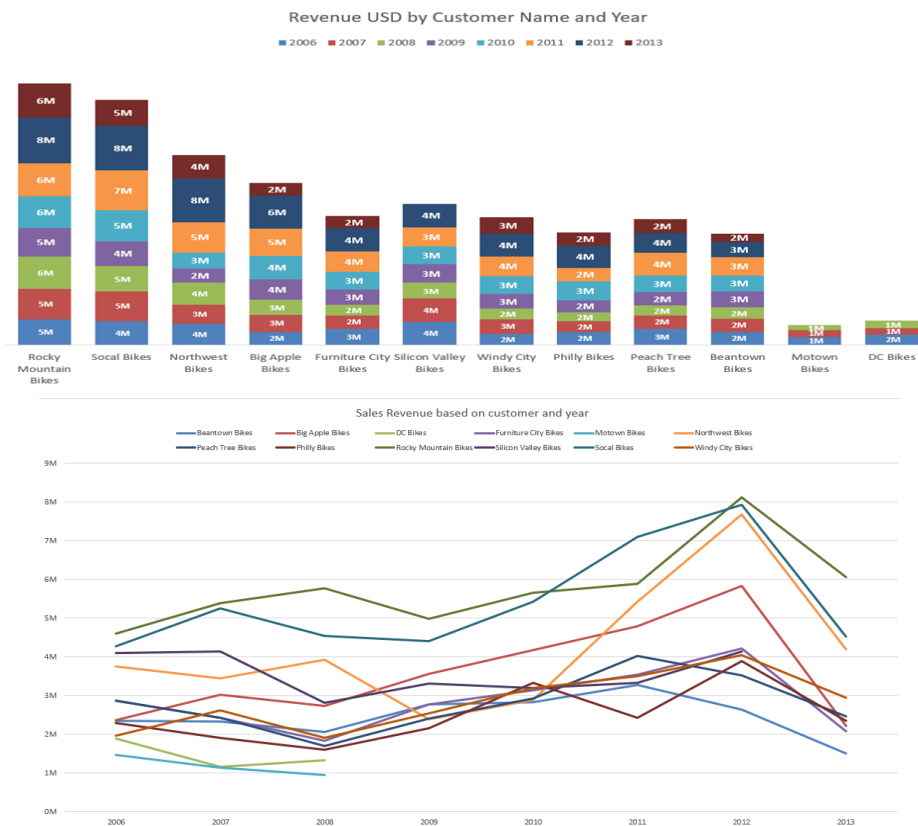


Chart 6 The US Revenue by Customer and Year

As per chart 6, The entire GBI customers show a sales peak in 2012 for most bike shops, indicating that year was particularly strong for the industry. However, there's an overall decline from USD 35.30 million in 2007 to USD 31.21 million in 2008. Most customers, including Big Apple Bikes, Furniture City Bikes, and Windy City Bikes, showed a decrease in sales from 2007 to 2008. DC Bikes and Motown Bikes remained the lowest in sales figures for both years and did not make any purchases from 2009 onward. Indicating these customers are no longer buying from GBI.

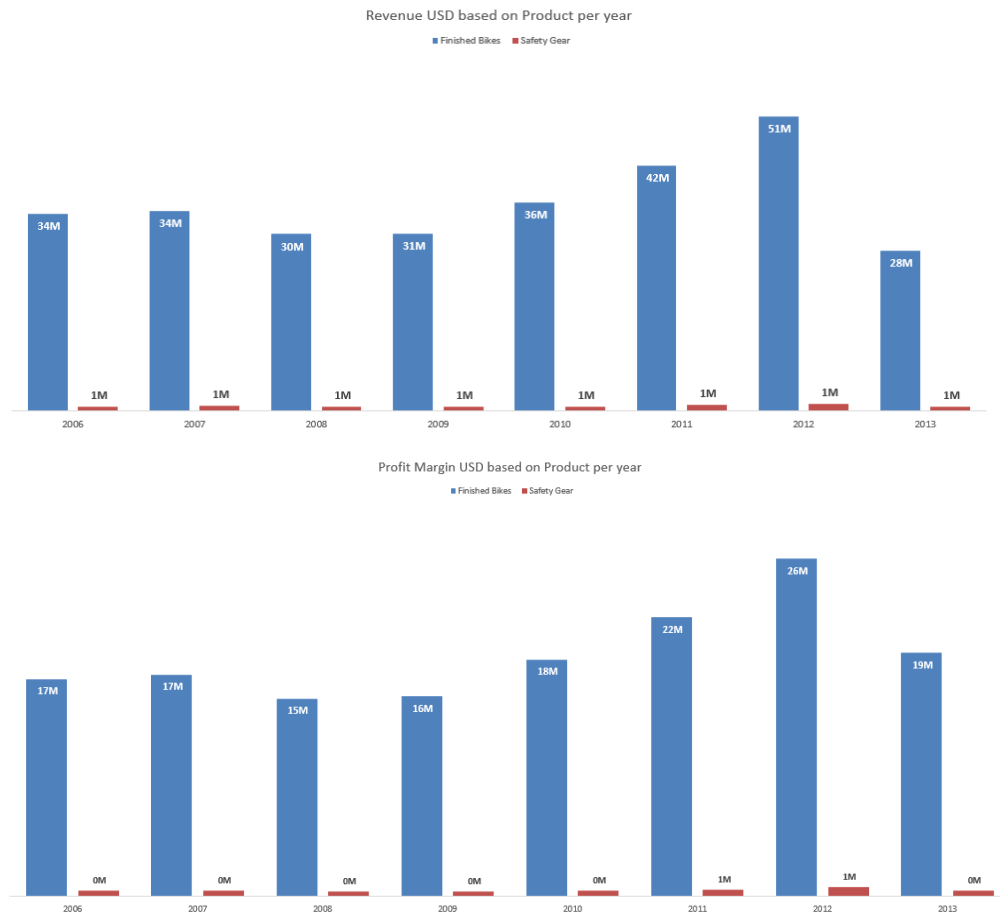


Chart 7 The US Revenue and Profit Margin by Product and Year

From the chart 7, The sales of finished bikes greatly overshadow the sales of safety gear, suggesting that the core business is much more focused on bicycles. Safety gear sales also show an overall increasing trend, although the numbers are much smaller compared to finished bikes.



The profit margin is relatively similar to the trend as sales revenue. There is a drop in 2008, and the market picking up back in 2009 onwards.

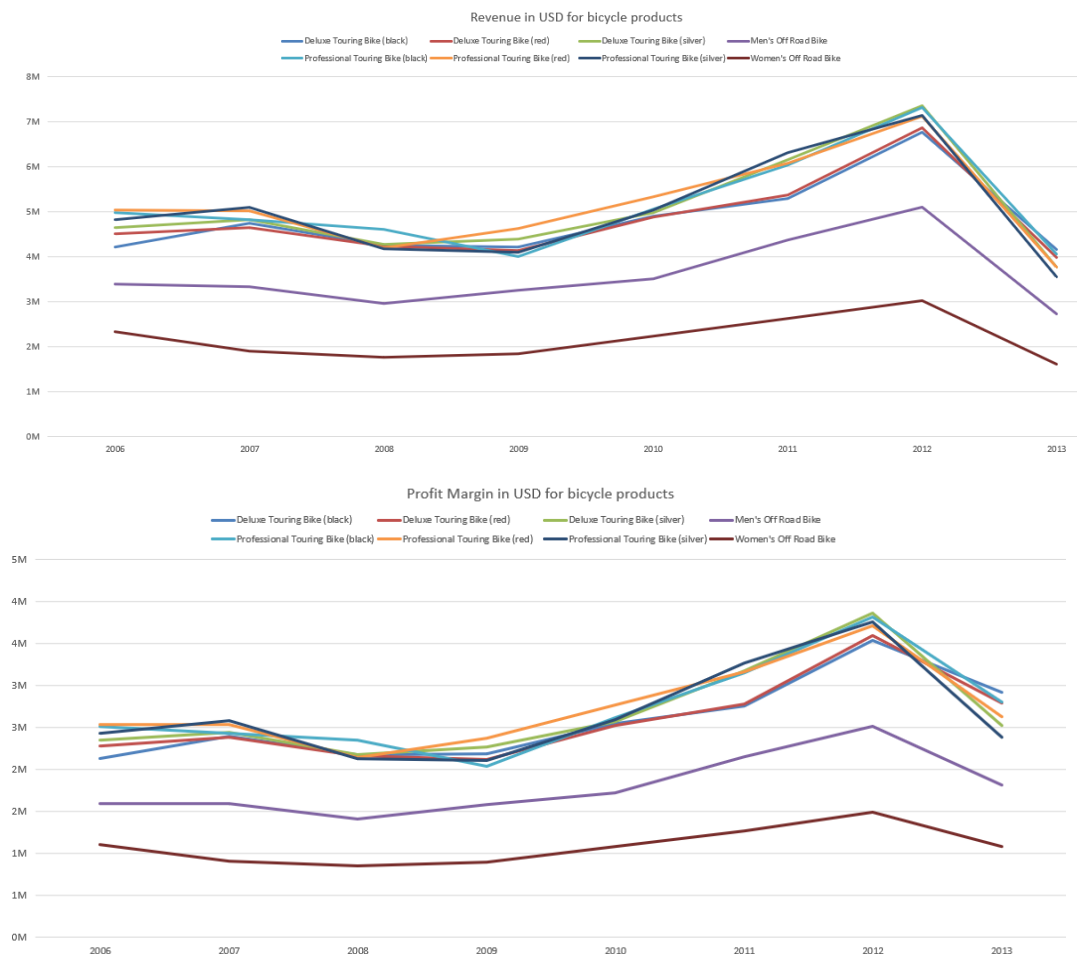


Chart 8 The US Revenue and Profit Margin by Bicycles Products

According to chart 8, In 2008, there's a notable decline in revenue for most products when compared to 2007. "The Professional Touring Bike", while also experiencing a decrease in 2008, seems to show relative resilience compared to the "Off-Road Bikes" and "Deluxe Touring Bikes". After the dip in 2008, there is a general trend of recovery and growth in revenue across all product categories up to 2012. Overall, "Professional Touring Bike" contributed the highest revenue and "Women's Off-Road Bike" and "Men's Off-Road Bike" saw the lowest. The profit margin for bicycles is proportionate to the sales trend.

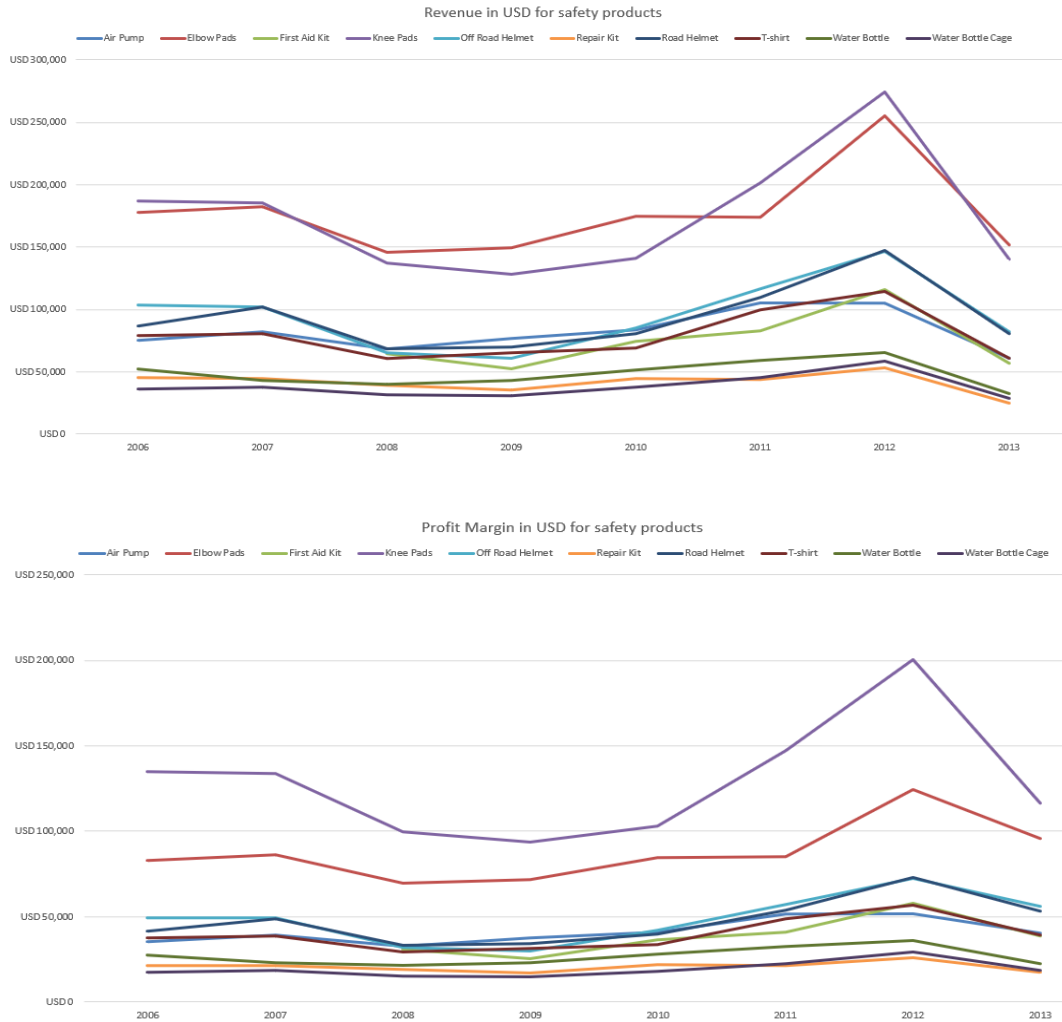


Chart 9 The US Revenue and Profit Margin by Safety Products

According to chart 9, In 2008, similarly there's a notable decline in revenue for most products when compared to 2007. Elbow Pads, Knee Pads, and Off-Road Helmet show a significant decline in revenue during this year. Air Pump, Repair Kit, and Water Bottle Cage also decrease but less drastic. After 2008, revenue for most items increases. Profit margin for safety gear is proportionate to sales trend. Knee pad shows profit margin USD 1.03 million which is relatively high to revenue USD 1.39 million.

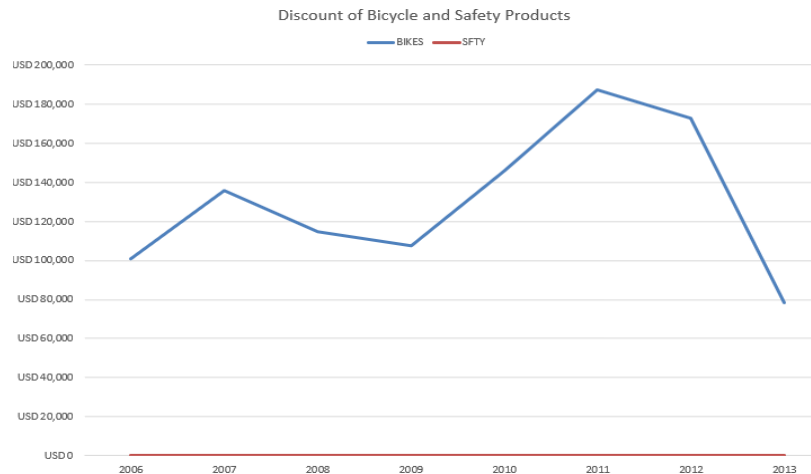


Chart 10 Total discount of bicycle and safety products

According to chart 10, the safety gear shows a value of USD 0 for each year, which implies that no discounts were given on safety gear during this period. Overall, the discounts on bicycles generally increase from 2006 to 2012, with a few fluctuations. There is a decrease in the discount amount in 2008 when compared to 2007 and the discount amount rebounded in 2009, but slight decrease in 2012.

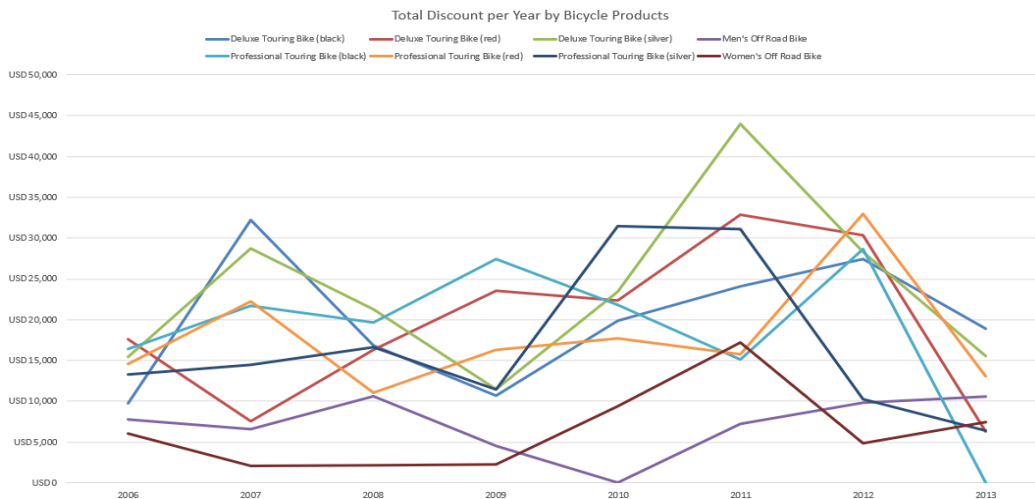


Chart 11 Total Discount per Year by Bicycle Products

According to chart 11, it shows an overall increasing trend in the discounts provided each year, except for a slight decrease in 2008 and 2009. Deluxe Touring Bike (silver) has the highest total amount of discounts given over the years and “Men's Off Road Bike” and “Women's Off Road

Bike” have the lowest total discounts. There are variations among product lines that suggest each product has different discounting strategies.

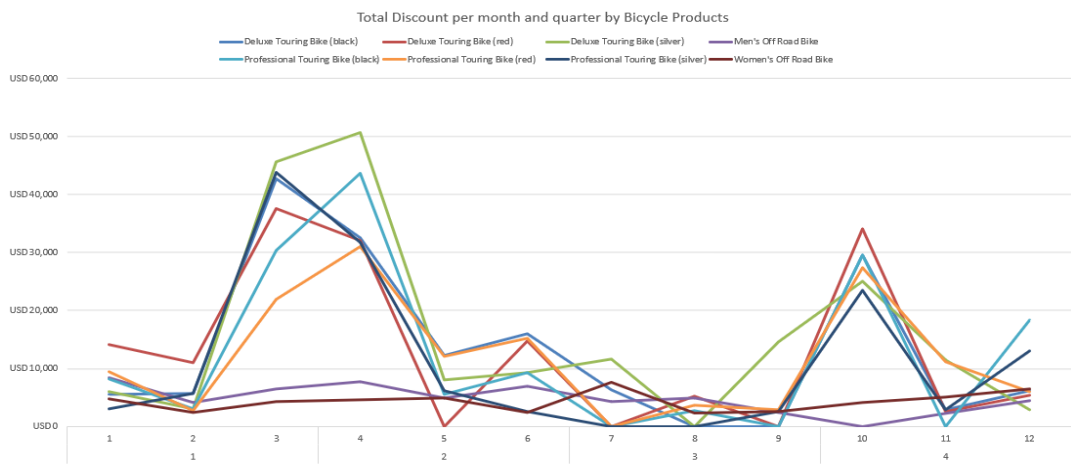


Chart 12 Total discount per month based on bicycle products

According to chart 12, the first quarter shows significant discounting, with a substantial portion of the discounts being given in March to April, in early quarter two. The third quarter seems to start slower in terms of discounts given. In quarter four, the discount has its peak in the first month, October.

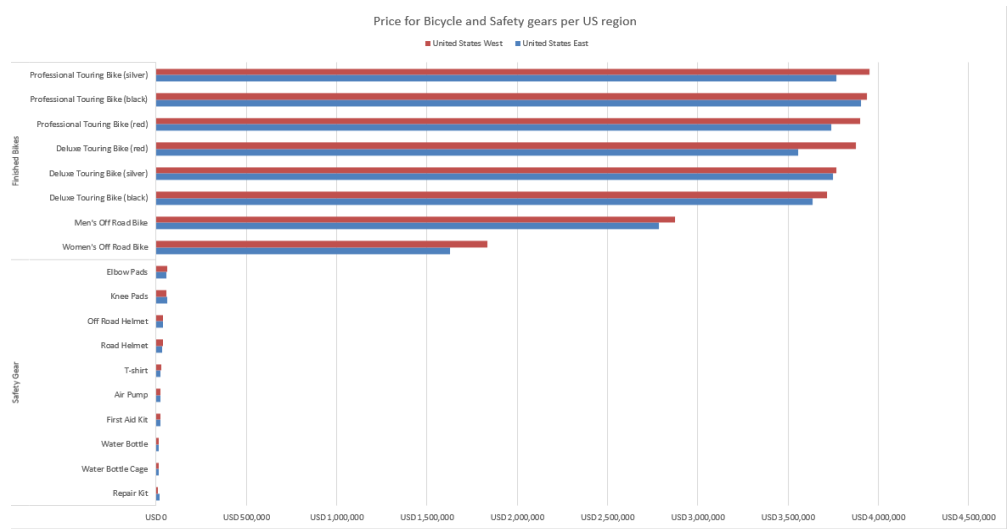


Chart 13 Bicycle and Safety gear sold per US regions

According to chart 13, The overall pattern indicates that the West United States generally has higher prices than the East United States for both bikes and safety gear, except for Knee Pads.

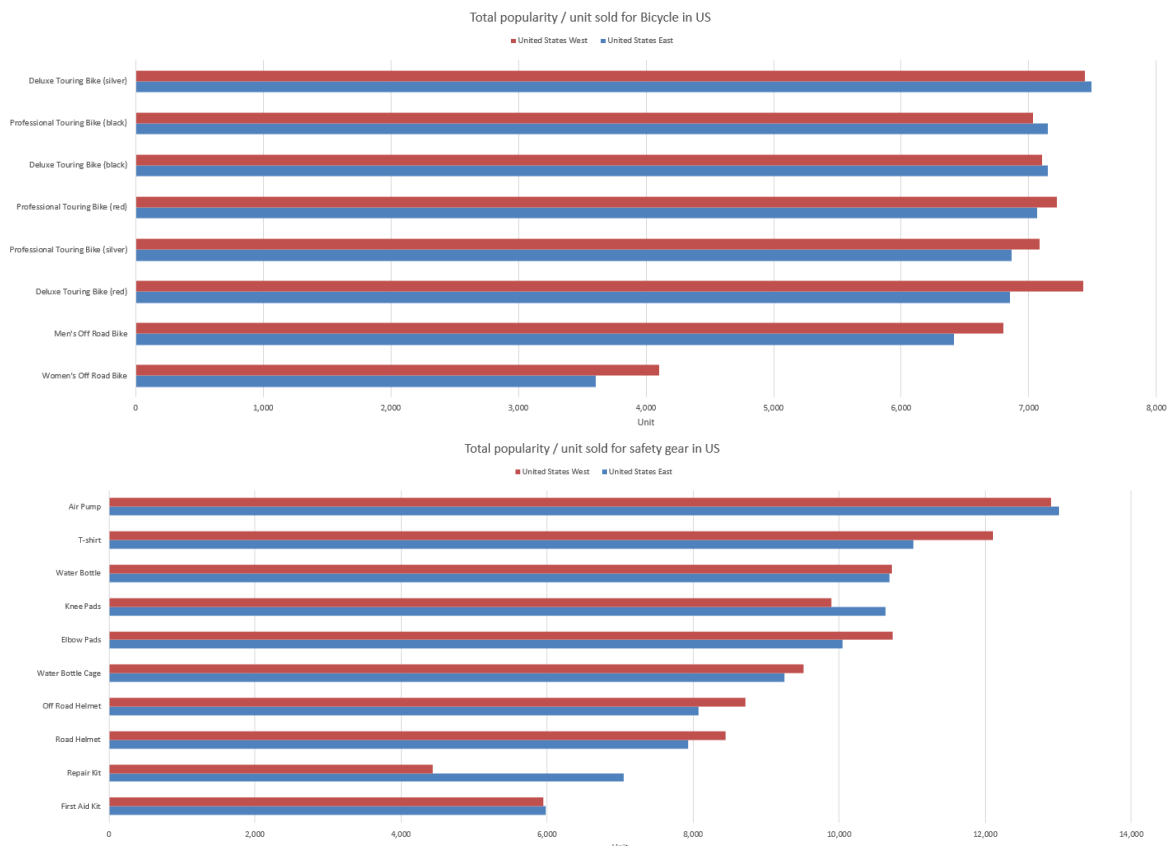


Chart 14 Bicycle and safety gear popularity based on total products sold in US Region

According to chart 14, In every category, the United States West has sold slightly more units than the United States East. The total sales volume for bicycles is slightly higher in the US West with 54,207 units, compared to the US East 52,591 units. This might indicate a higher demand or a larger customer base in the US West region. "Deluxe Touring Bike (silver)" is the top seller in both regions with a total of 14,931 units sold, while "Women's Off Road Bike" shows the lowest quantity and the largest relative difference in favor of the West.

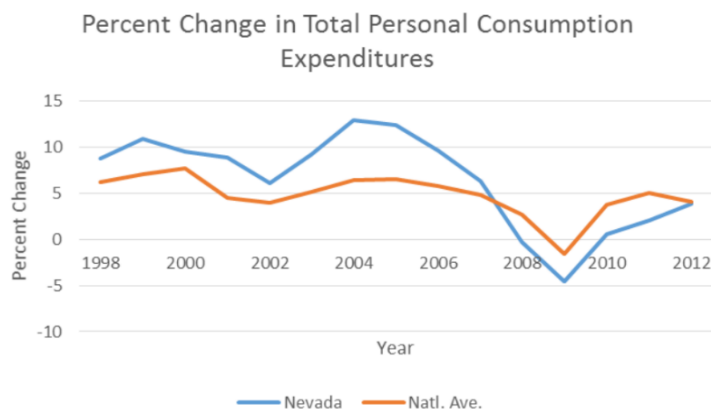
As for the safety gears, the total quantities sold are almost evenly split between the United States East 93,690 units, and United States West 93,407 units, with the United States East having a slightly higher total. Air Pump is the top-selling item in the East, while T-shirts have the highest sales in the West. First Aid Kit has the lowest quantity sold, but the distribution is nearly identical in both regions.

### 3.c Information Analysis

#### 3.c.i The Great Recession 2008

In December 2007, the United States entered a global financial crisis often referred to as the Great Recession that would last until mid-2009, the recession marks a significant period of economic downturn in the United States. Increase in price and unemployment rate rising sharply as employment loss of nearly 2.6 million jobs, making the worst year for job loss since 1945, had a significant impact on various industries including the bicycle market in the United States (Uchitelle, 2009).

During this period, most Americans saw a shift in their consumer buying behavior. There was an uptrend in coupon usage, preference on sales items, and tendency to maximize the value of every dollar spent (Betsy et al., 2009). The recession increases consumer tradeoff between perceived value and price. Which has an impact on spending of higher priced items such as premium bicycles (Reid, 2023).



Snipped 5 The US consumer spending during the great recession, taken from (Guinn Center, 2014)

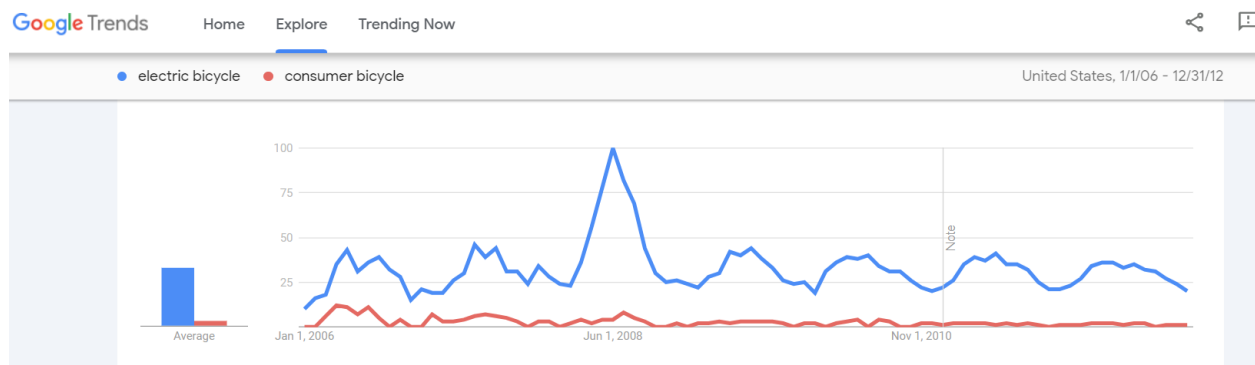
Some reports say the bicycle industry is somehow resilient to the economic downturn (Reid, 2023). As bicycles provide a cost-effective alternative to motor transportation, especially increase in fuel price, and are more environmentally friendly. In GBI case however, as indicated in the introduction part, mainly focus on manufacturing durable, high quality and reliability touring and off-road racing bicycles. These products are considered discretionary items for many Americans. Consumers tend to delay their purchase of non-essential items, including high end bicycles.

### 3.c.ii Presence of E-bike

One of the most noticeable innovations in the bicycle industry during 2008 was the advancement and increased awareness of electric bicycles or e-bikes. Electric bicycles incorporating electric motors to the pedals has gained much attention after the great recession where customers are looking for alternative modes of transportation without sacrificing mobility.

There is also innovation in pedals, including materials and designs that enhance comfort and efficiency, likely beginning to gain traction in 2008. E-bikes are ideal for everyone because e-bikes do not rely 100% on human physical capabilities, instead using a motor to move (Dillenberger, 2019). E-bikes are a good alternative for public transportation, motor cars because of their low-cost maintenance and relatively easy to configure.

Another main factor of people favoring e-bikes is that it can provide benefits such as improving fitness, low cost, reducing global emissions, and safe for the environment.



Snipped 6 Google Search Trend for Electric Bicycle and Consumer Bicycle

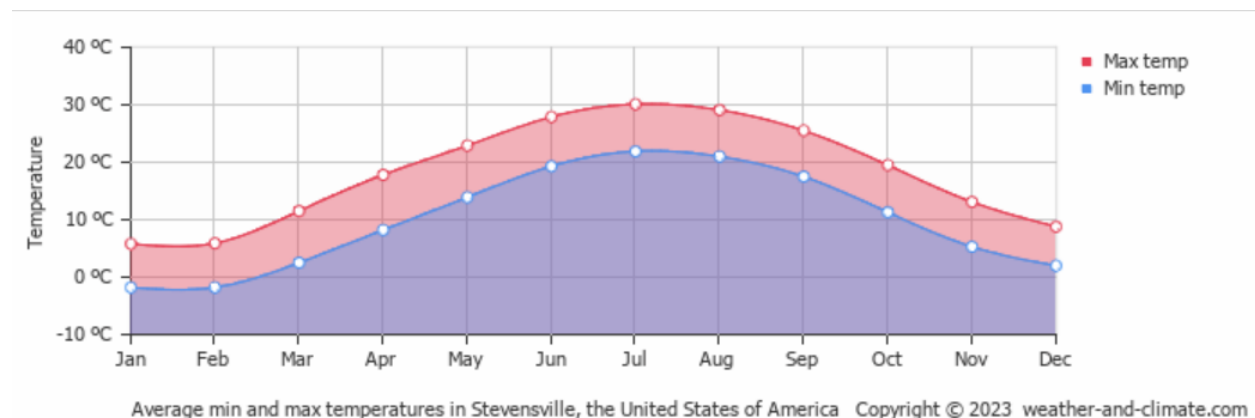
Google trends is a searching tool in real time to measure the number of searches in particular things, topics, or places in a particular time frame. Figure above compares the search using keywords “electric bicycle” and “consumer bicycle” from January 1, 2006, until the end of December 2012. The result shows the search for bicycle comparison electric bicycle shows a significant increase outweighing the search for consumer bikes on June 1, 2008.

### 3.c.iii Emergence of Bike sharing

The emergence of bike sharing schemes (BSS) a bike sharing program getting in demand in the mid-2000s with the existence of systems like Velid in Paris and Velo'v in Lyon (Leighton, 2015). Sharing bikes is no longer an afterthought in urban transportation planning but a key component of local authorities to reduce congestion, pollution and promote healthy living. The great recession turned people to shared resources for their transportation needs. New York Times reported that overall bike shares sales grew by 65% in 2020, as the sales of e-bikes increase, which is why shared bikes are often used in bike sharing (Glusac, 2021).

### 3.c.iv Seasonality in the sales of bicycles.

The bicycle industry, like many other industries, would have seasonal fluctuations in sales revenue. In the United States, it experienced the traditional 4 seasons in 2008. The spring and summer season, which on average span between March to August, typically lead to an increase in bicycle usage and sales. While during winter season, usually see a decline in sales due to less favorable cycling conditions. The sales revenue of GBI in 2008 reflected a similar pattern. According to the sales revenue of GBI in the United States, the highest sales were recorded in February until April, September until October which are conducive to cycling.



Snipped 6 Average Min and Max Temperature in Stevensville, taken from (Weather & Climate, 2023)



The graph above shows the average, max and min temperature in the Stevensville in the United States (Weather & Climate, 2023). During March to May, the average temperature in the United States was around 10c~30c and similar temperatures were recorded in September to November. This temperature range is conducive for cycling. Hence, it has reflected, to a certain extent, in the seasonal sales performance.

### **3.d Knowledge Analysis**

#### **3.d.i Innovation**

The need for business to innovate is universally acknowledged across industries to ensure business competitiveness and sustainability. With the behavior of spending change, introduction of electric bikes gaining popularity among the United States citizens, innovation is a critical driving force for GBI to remain competitive and responsive to market demands.

According to Galvin, the bicycle industry has witnessed a high level of innovation for its product level and material components (Galvin et al., 2020). A study from the late 1970 to 2010 covering significant innovation happening across the bicycle industry and importance of continuous product and process innovation for maintaining a competitive edge (Galvin et al., 2020). The Taiwanese bicycle industry cluster conducted a study that said innovation is crucial for company survival, especially for small and medium sized enterprises (SME). By adopting new knowledge and technologies, an organization can enhance its capabilities and competitive advantage (Gerke et al., 2023).

As GBI invests heavily in keeping the relation with its main retailer, thus it is crucial to have standardization of the innovation ecosystem for industry collaboration. Taiwan's case demonstrates variability of digital sources and level of digital innovation can promote co-creation and standardization across the global bicycle industry (Su et al., 2023). According to Schweisfurth & Raasch, 2015, companies can innovate by working with organizations that are in a similar domain (Schweisfurth & Raasch, 2015). GBI can have strategic relations with selected parties to mutually improve the business.

The concept of responsible corporate focus on the impact an organization can make on society has gained traction over the years. Responsible innovation is the practice of aligning business practices

with societal and environmental considerations. Hellobike's journey shares about how shared bicycle companies can navigate through challenges through responsible innovation managing business networks (Liu et al., 2019). Such an approach is beneficial for GBI to ensure sustainable growth and corporate responsibility.

A study conducted by China's shared bicycle industry underscores prioritization of user safety and friendliness as key factors leading to responsible innovation. This case highlights how innovation is not solely on technological advancement but also addressing user concern and enhancing customer experience (Liu et al., 2019). In addition to that, Shanmuganathan states that innovation can be derived from the customer or user itself (Shanmuganathan, 2018). Positive engagement with users or customers helps gather feedback, provides ideas and knowledge to help organizations encompass their customer needs and reduce the risk of product failure (Haciyev, 2019).

### **3.d.ii Customer Satisfaction**

In the competitive landscape of the global bicycle industry, customer satisfaction has emerged as utmost important for success and longevity, especially for GBI, which relies on niche professional, pro-consumer market segment. Strategic strategy is crucial for GBI to significantly impact on its market position and financial performance. According to Tahir & Raju, there is a linear positive relationship between customer satisfaction and sales growth of the company (Tahir & Raju, 2020). Innovations can also derive from knowing customer satisfaction and identifying what customers really want (Schweisfurth & Raasch, 2015).

Harvard Business Studies mentioned the importance of distinguishing between understanding customers and actively listening, suggesting that customer satisfaction is rooted in company willingness to actively engage to customer feedback and needs (Hult, 2022).

This study emphasizes that product quality is a crucial independent variable affecting customer satisfaction (Bhowmick & Seetharaman, 2023). GBI prides itself on delivering high quality bicycles to the touring and off-road racing market segment. This strategy of delivering and commitment to deliver its promise is a cornerstone of GBI customer satisfaction. Numerous studies have been conducted confirming that satisfied customers tend to be more loyal and engage in spreading positive mouth (Suchánek & Králová, 2019).

### **3.d.iii Advertising**

Advertising and promotion are key components of the marketing mix, serving to inform, persuade and remind customers about products and services. As GBI is in a niche segment, it is crucial to employ effective targeted marketing strategies to resonate with its customers. Leveraging awareness, social, and governance (ESG) is a powerful way to connect customers who prioritize sustainability (Reid, 2023).

To stand out from the competitors, businesses in the bicycle industry need to have effective advertisement and promotion strategies such as advertisement and promotion which can increase brand awareness (Sinclair, 2020). Online advertisements are proven to increase the profit on certain items. (Bansal & Sharma, 2016). In addition, advertisements indirectly change customer buying behavior (Bansal & Sharma, 2016) and banner advertisement could increase offline shop by 2% (Osinga et al., 2019).

## **4. Critical Analysis**

The global recession 2008 has a significant impact on the bicycle industry in the United States. It changes customer buying behavior and reduces customers spending. This is reflected in the sales and revenue in GBI in the similar year. Most US customers are more careful in spending their dollars to only buy necessity goods which badly affect the sales of "Professional Bikes" and "Touring Bikes". The recession, however, lasted until mid of 2009, which brought sales of GBI back to its normal steady growth in upcoming years.

The dreadful impact of the great recession can be seen as 2 retailers have not made any purchases since 2008. This could happen because the economic factor pushes the business to do the restructuring of its business. Possibility of these businesses not focusing on selling high end products or looking for budget bicycles or closing the business for good. Further analysis is required to find the causes of GBI loss of its customers.

Similarly, Silicon Valley Bikes did not make any purchases in 2013. Initially, Silicon Valley was one of the biggest contributors for GBI sales. It can be assumed that there is a possibility of Silicon Valley restructuring its business or focusing on different products that are not offered by the GBI such as electric bikes.

According to sales of each product in GBI, it can be seen that sales of "Women's Off Road Bike" and "Men's Off Road Bike" have the lowest sales and compared to other bicycle categories. GBI product discount strategy mainly focuses on touring bikes as seen on the higher discount amount, they are giving. Reflecting the amount of discount and number sales has a positive relationship on the GBI products. The highest discount could contribute to the higher sales amount.

Another noticeable from the knowledge analysis emergence of electric bikes in the United States that gained much attention from the Americans. As e-bikes rely on motors not the physical ability of its user, it can be an alternative for public transport cars and because of its environmentally friendly and easy to navigate.

As part of insights from knowledge analysis, it is important to reiterate that usage of advertising and promotion is paramount in driving customer satisfaction and having an innovative mindset can positively improve GBI sales and revenue. Equally important is to consider the interplay of various factors as elaborated in the PESTEL and SWOT analysis below.

#### 4.a PESTEL Analysis

As the GBI in the bicycle industry is volatile to the external environment, it is imperative for GBI to navigate through the macro environmental factors that could influence its marketing strategy for future growth. A PESTEL analysis provides a comprehensive look at the Political, Economic, Social, Technological, Environmental and Legal Factor that must be considered in the strategic planning.

Political	Economic	Social	Technological	Environmental	Legal
<ul style="list-style-type: none"> <li>• Government policy (trade tariff)</li> <li>• import-export regulations</li> <li>• infrastructure development</li> </ul>	<ul style="list-style-type: none"> <li>• Economic downturn</li> <li>• Economic upturn</li> </ul>	<ul style="list-style-type: none"> <li>• People awareness</li> <li>• Buying behavior</li> <li>• Latest trend</li> </ul>	<ul style="list-style-type: none"> <li>• Product design,</li> <li>• Manufacturing process</li> <li>• Marketing techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Eco friendly material and production</li> <li>• Reduce carbon footprint</li> <li>• Highlight CSR</li> </ul>	<ul style="list-style-type: none"> <li>• Safety regulation</li> <li>• Patent law</li> <li>• Consumer right</li> <li>• Legal requirements</li> </ul>

#### 4.b SWOT Analysis

SWOT analysis is a framework to identify and analyze an organization's strengths, weaknesses, opportunities, and threats. First and second Quarter of 2013 shows the highest sales revenue and profit margin for GBI. It indicates that GBI is navigating a dynamic and evolving market with positive projected value. The SWOT analysis helps to dissect the company's internal and External environment to identify strategic pathway and potential pitfall in the future.

strengths	weaknesses	opportunities	threats
<ul style="list-style-type: none"><li>• Market Presence</li><li>• Diversified product range</li><li>• Customer loyalty</li><li>• Efficient Distribution (The US &amp; Germany)</li></ul>	<ul style="list-style-type: none"><li>• Sales Pricing strategy</li><li>• Discount &amp; Promotion strategy</li><li>• Low performing sales (women off-road &amp; men off-road)</li></ul>	<ul style="list-style-type: none"><li>• People awareness in health</li><li>• Strategic partnership with technology firms</li><li>• Introducing new product (E-Bikes)</li></ul>	<ul style="list-style-type: none"><li>• Past pace industry (innovation in products and material)</li><li>• Shifting customer buying behavior</li><li>• Economic uncertainty</li></ul>

#### 5. Final Deliverables

GBI has faced challenges that affected the sales revenue and profit margin from internal and external sources. To navigate the future successfully, GBI must adapt to the market dynamic and consumer preferences. This part will provide suggestions, solutions, and strategies that GBI can utilize to increase the sales revenue and profit margin in the future to keep its competitiveness.

## 5.a Introduction of new product

The search trend for electric bicycles has shown a substantial increase, indicating a shift in consumer preferences as seen on google trends search. In addition, the introduction of GBI e bikes could expand the product line with a wider market segment and not only limit it to niche pro consumer markets. Besides that, the introduction of e-bikes could open more opportunities for GBI to explore the latest technology and be a catalyst for innovation in GBI. According to Fortune Business Insight, consumers are increasingly looking for e-bikes with a blend of performance, design, and value. Besides, preferences include versatility such for commuting, recreation and cargo carrying (Fortune Business Insights, 2023). Below are e bikes categories identified in the market suitable for GBI.





Urban Commuter E-Bikes	Cargo E-Bike	E-Bike for Kids and Teens	Adventure E-Bike
<b>Features</b> <ul style="list-style-type: none"><li>• City usage</li><li>• Ease of use</li><li>• Lightweight</li><li>• GPS tracking</li><li>• Theft prevention</li></ul>	<ul style="list-style-type: none"><li>• Cargo transportation</li><li>• Delivery capabilities</li><li>• High load</li><li>• Stability</li><li>• Modular Cargo attachment</li></ul>	<ul style="list-style-type: none"><li>• Safety features</li><li>• Parental control mechanism</li><li>• Stylish design</li></ul>	<ul style="list-style-type: none"><li>• High performance for off road</li><li>• Durable</li><li>• Long range battery life</li><li>• Stylish design</li></ul>
<b>Model sample</b> 			

Table 5 List of E-bikes Categories

## 5.b Strategize the low-selling product

The "Women's Off Road Bike" has the lowest sales with the lowest profit margin compared to other bicycle products. It could suffer from lack of targeted marketing and product design that does not align with specific needs and preferences of female riders.

GBI could invest more in R&D to innovate the design and functionality of its off-road bicycles, making it appealing to the targeted segment. In addition, rebranding campaigns around unique

selling points of "Women's Off Road Bike" could spark interest in the products. Marketing should be focused on the health benefit of women, ESG alignment, the exciting adventure of off-road cycling. Partnership with influencers and athletes in the off-road cycling community could also enhance visibility and credibility.

A comprehensive customer satisfaction survey helps to gather quantitative and qualitative data from owners, potential customers, and industry experts. The analysis from the survey helps GBI evaluate patterns and insights for its business performance. Similarly, it can help GBI gain insight into why "Women's Off Road Bike" and "Men's Off Road Bike" are not selling well. Possible questions for a survey as below.

Topic	Possible Answer
Demographic Information	Age, gender, geographical location, cycling frequency
Product Usage	How often do user cycling
Satisfaction Levels	Measure customer satisfaction, their preferences (design, comfort, performance, durability, and price)
Purchase Drives	Primary reason for purchasing
Barriers to Purchase	Factors deter customer from purchasing
Competitive Analysis	Comparing products with competitors offering (feature and price)
Future Expectations	Gathering insight on desired improvement

Table 6 Survey Question and Answer

### 5.c Focus on online advertisement

Online advertisements for mobile and desktop are proven to increase the sales revenue. GBI must ensure that existing advertisements are optimized for visibility and engagement. Strategic ad placement on relevant websites or platforms such as cycling online forums, outlets, environmental blogs can increase visibility of the website. Once all in place, GBI must implement performance tracking mechanisms. Such as click-through rates, conversation rates, and ROI on the ad spent. This will enable continuous improvement of advertising strategies.

As for the cycling forum, here are some of the most popular cycling forums in the United States for GBI to consider.

1. Bike Forums (<https://www.bikeforums.net/>)
2. Road Bike Review Forums (<https://forums.roadbikereview.com/>)
3. Mountain Bike Review Forums (<https://forums.mtbr.com/>)
4. Cyclingnews Forum (<https://forum.cyclingnews.com/>)
5. Bike Radar Forum (<https://forum.bikeradar.com/>)

#### 5.d Offering Discount and during seasonality

As identified in the data analysis section, the bicycle industry is highly affected by seasonality. During the conducive season for cycling such as spring, summer and fall, consumers are more inclined to engage in outdoor activities. Leading to increased bicycle sales. To capitalize this seasonality, GBI should implement a strategic discount and promotion aligned with weather patterns.

Spring and summer are prime times for bicycle retailers. Launching early spring promotions could encourage consumers to prepare for the cycling season. Encouraging bundle discounts, such as offering discounts on safety gear together with the purchase of bikes, can increase the average order value.

On the other hand, during off peak seasons, typically winter, people tend to spend time indoors. GBI could leverage off-peak discounts on a range of bicycles that are not associated with winter sports such as road bikes. Early bird specials could target potential customers planning to start cycling in the spring. In summary, the possible discount and promotion campaign is below.

Seasonal Promotion Strategies		Description
Off Peak Season	Off-Peak Discount	Discount on products not associated with season
	Bundle Promotion	Package accessories (light, socks, maintenance kit)
	Loyalty Program	Point redeemable against future purchase
	Tied Discount	Larger discount on higher end model
Peak Season	Early Bird Specials	Discount a month before peak season
	Event Driven	Discount of holiday season such as Earth Day Promo
	Flash Sales	Limited time discount

Table 7 Seasonal and Promotion Ideas



## **6. Conclusion**

This report has identified the business problems related to the sales performance of GBI and proposed strategies to overcome them. It was done by applying Business Intelligence techniques to the sales department data of GBI. It explored the organization's memory and integration of the company's data, conducted Critical Data, Information and Knowledge Analysis. Based on the analysis outcomes, offered recommendations to improve the sales performance.

Therefore, this paper has utilized internal and external sources in obtaining a thorough understanding of the aspects that impacted GBI's sales performance and profit margin trends in the United States market during the reference period. The paper has also offered practical and effective suggestions to tackle the highlighted issues and take advantage of possibilities, with the ultimate objective of improving GBI's sales performance and profit margin in the United States market, as espoused in four distinct deliverables.

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