

# The Role of Data Analytics in Customer Behavior Analysis and Market Strategy Optimization (A Case Study)

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## Abstract

In the highly competitive global retail market, understanding customer behavior is essential for sustained business growth and strategic decision-making. Stellar Peak Sports & Adventure, a multinational retailer specializing in sports and outdoor products, is facing operational challenges due to a lack of deep customer insights. This deficiency has resulted in inefficiencies in marketing strategies, inventory management, and overall business performance. To address these issues, the company has enlisted the expertise of a business analyst to conduct comprehensive customer analysis. This study employs a data-driven approach to identify and analyze key customer attributes, including demographic segmentation, purchasing behaviors, membership trends, and engagement patterns. The business analyst will determine the most relevant data sources, apply statistical and machine learning techniques to extract actionable insights, and develop interactive visualizations through a dashboard, enabling the company to monitor customer trends in real-time. Moreover, the study will critically assess potential risks associated with data analytics, such as data quality issues, biases in predictive modeling, and the challenges of integrating analytics into decision-making frameworks. Through a rigorous evaluation of customer data, this research provides strategic recommendations to optimize marketing campaigns, enhance customer segmentation, improve sales forecasting, and strengthen customer retention strategies. By leveraging advanced analytics, Stellar Peak Sports & Adventure can develop data-driven operational improvements, refine business strategies, and achieve a sustainable competitive advantage in the global sports and outdoor retail industry.

**Keywords**— Business Intelligence, Business Analytics, Customer Analytics, Visualization Data

## 1 Introduction

Stellar Peak Sports & Adventure is a multinational retailer specializing in sports and outdoor products. With a workforce of over 1,000 employees and a customer base exceeding 90,000 individuals, the company operates a large-scale business in the global market. Stellar Peak Sports & Adventure maintains partnerships with more than 60 suppliers and processes approximately 150,000 orders annually across multiple countries. While the company has a strong international presence, its primary market focus remains in the United States, where its corporate headquarters is located. Customers can purchase products through multiple retail channels, including e-commerce platforms, specialized category stores, and traditional brick-and-mortar outlets.

Despite its strong market presence, Stellar Peak Sports & Adventure faces challenges in understanding its customer base and optimizing business operations [1]. To address these challenges, the company aims to leverage data analytics for customer analysis to enhance profitability and improve customer satisfaction. As part of this initiative, the company is hiring a business analyst to assess customer data, including customer demographics, order histories, purchasing behaviors, and geographic distribution. These data points will be systematically collected, stored

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in a database, and analyzed to identify potential customer segments, purchasing trends, and areas for business improvement [2].

This paper is a review assignment conducted while studying SAS Data Analytics Application Software, focusing on how customer data analytics can drive strategic business decisions. The study will explore the use of SAS analytics tools to process and visualize customer data, generate insights, and provide data-driven recommendations for enhancing decision-making. By leveraging business intelligence and advanced analytics techniques, Stellar Peak Sports & Adventure seeks to refine its marketing strategies, improve sales forecasting, and strengthen its customer engagement efforts.

### 1.1 *Problem Faced*

Stellar Peak Sports & Adventure is a global retailer specializing in sports and outdoor products, operating across multiple countries and continents. Over the years, the company has achieved significant success in its business operations and strategic decision-making, establishing itself as a major player in the industry. However, despite its expansion, Stellar Peak Sports & Adventure is now facing critical challenges in its business strategies due to a limited understanding of its customer base. Although customers are the foundation of the company's operations, the lack of detailed customer insights has hindered its ability to refine its marketing approaches, optimize product offerings, and improve overall business performance [3].

As a result of these gaps, Stellar Peak Sports & Adventure has begun experiencing a decline in revenue, ineffective marketing strategies, and increasing dissatisfaction among customers. Additionally, the company faces growing competition in the market, threatening its ability to maintain its stronghold in the industry. These challenges have prompted the company to take proactive measures by hiring a business analyst to conduct a comprehensive investigation and analysis of customer data [4]. The primary objectives of this analysis include answering key business questions:

1. How many customers are located in each country and continent?
2. What is the purchasing behavior of members versus non-members?
3. How many customers have made purchases, and what is the total quantity of products ordered over time?
4. Which products are most and least attractive to customers?
5. Which age groups prefer specific product categories?
6. How do profits and revenue correlate with different customer segments?

The business analyst will be responsible for collecting, processing, and analyzing these customer insights to provide data-driven recommendations that will help Stellar Peak Sports & Adventure improve its strategic decision-making and operational efficiency. If the company does not take decisive action, it risks continued revenue decline and losing its competitive edge. Therefore, through a rigorous customer analytics approach, the analyst will help the company develop targeted strategies to enhance customer satisfaction, boost profitability, and strengthen its market position [5].

## 2 **Proposed Solution**

Nowadays, business analytics is used by most organizations in improving their operations and decision making or achieving their goals. The business analysis as used to identify and understand what is about the organization through a set of techniques and tasks which is used to communicate or cooperate between stakeholders [6]. That means business analytics can help an organization to achieve its goals via the strategies that are established based on the analysis. For example, an organization can develop new products by analyzing the requirements of customers.

The goal of business analytics is to provide a way for organizations to realize revenue and reduce costs of sales, as well as understand how organizations work [7]. Business Analytics has three types of analytics, which are descriptive analytics, predictive analytics, and prescriptive analytics. Descriptive Analytics is a simple kind of analytic that is usually used to analyse data for the information. The second is Predictive analytics can take research and analysis of current events and data to predict the events that may occur in the future. Then, prescriptive analytics is one of the business types, in simple, that provides suggestions, plan or measures according to the possible future predicted [8].

A person who performs business analytics activities is called a business analyst. Bob Gregory, a professor for business analysis said, 'Identifying and then prioritizing technical and functional requirements tops the business analyst's list of responsibilities' [9]. Business analysts could identify and describe the solution that can provide the

maximum value to the organization and its stakeholders according to these requirements. Organizations should include business analysts at all levels of business for providing required information for them to recognize and analyse in order to address everything faced.

Hence, as the analyst of Stellar Peak Sports & Adventure should be responsible to analyse the information of the customers in order to improve decision making. The customer information collected by each department and then stored into a database after distinguishing. Analysts are able to identify and define the data that is useful for the current issues of the company, for instance, customer's age, distribution, quantity ordered and others. According to the issues above, the analyst required to analyse these useful data to investigate the cause and provide the best solution or suggestion to Stellar Peak Sports & Adventure to improve its strategies and operation [10].

Firstly, the business analyst should identify what products are unattractive by analyzing the quantity ordered by the customers. The quantity of the products ordered indicated product satisfaction among the customers. If the quantity is small, the products may not meet the requirements of the products. Then, the business analysts also should investigate the number of customers around each continent and country in order to identify the range of sales for the company. Besides that, customers' quantity ordered, types and the revenue of the products would be investigated according to the gold members, basic members and non-members. The investigation proposed to identify the sales differences between each customer group. In addition, the sales of products will be classified to the age group of the customer to define the segments of the customer. The number of customers and products ordered each year would also be analysed by the analyst to assess the variety of sales [11].

These analysis and investigation will help to improve the decision making and establish an effective strategy of the Stellar Peak Sports & Adventure. For example, Stellar Peak Sports & Adventure is able to build a second headquarters in the area which has the second greatest number of customers. Also, the company can redesign or improve the performance of the products to increase sales.

### 3 Result and Solution

#### 3.1 Dashboard

Dashboard is a common component that is often used in many platforms or software including BI or BA platforms, performance measurement software suites or business performance management systems, that is offering major information on a single screen. This information is visualized after consolidating and arranging, which is easy for users to access, view or analyse. Dashboard able to transform data into information, and then visual these for presenting into the business that can help them to accelerate the decision-making process [12]. For example, these visualization data and measures would help organizations to perform improved analysis and appropriately adjust strategy and their goals. In addition, companies are able to make the best decision by identifying market trends through the dashboard. Therefore, most organizations prefer to use the dashboard as the tool of business intelligence because it has more efficiency and usability compared to other business intelligence tools. Organization can identify the market trends.

Figure 1 shows the dashboard that was designed by the business analyst which displays all analysis that fits the requirement of the company. The dashboard is able to help Stellar Peak Sports & Adventure and analyst to analyse these customer data with a clear vision and understanding. These data include the age group, number of customers, customer group, profit and revenue, quantity ordered of products and others, which are visualized for the company to easily view this important information, for example, the bar chart shows the quantity of products ordered by customer group.



Figure 1. Dashboard of Stellar Peak Sports & Adventure

### 3.2 Visualization

Figure 2 and Figure 3 show the number of customers between each continent and country, with almost 952,000 of the total number of customers. On the continent, most of the customers are concentrated in the Europe continent, where the number is as high as 653,684. Followed by South America and Oceania, the number of customers in these continents is 235,708 customers and 60,397 customers respectively. The continent which has the fewest number of customers is Africa, with only 770 customers purchasing the products of Stellar Peak Sports & Adventure. On the other hand, the United States has the 232,258 number of customers which is the largest among the countries as Figure 3 shown. And Germany, is second to the United States, with 125,631 customers, which is located in the Europe continent that has the largest customer. Surprisingly, China as one of the world's largest economies has only 3 customers of the Stellar Peak Sports & Adventure.

It can be seen that the sales activities of the Stellar Peak Sports & Adventure are focused on the Europe continent and North America continent. Hence, Stellar Peak Sports & Adventure could do research to establish the cause in the fewer number of customers in terms of some countries and continents. The company then can build some strategies to expand its customers' segments in order to increase its revenues and profits, for example, greatly advertise its products or produce the new products.

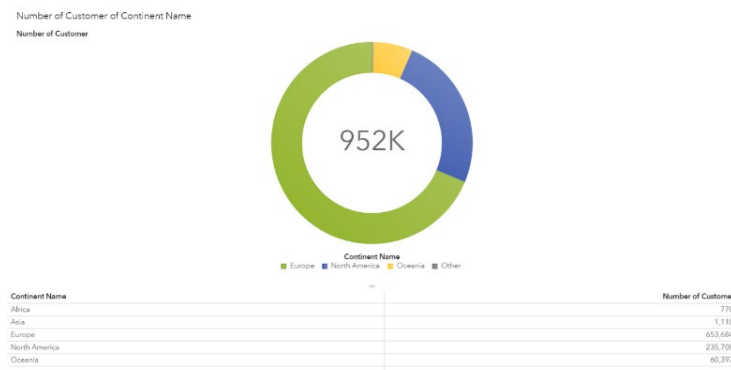


Figure 2. Pie Char for Number of Customer of Continent Name

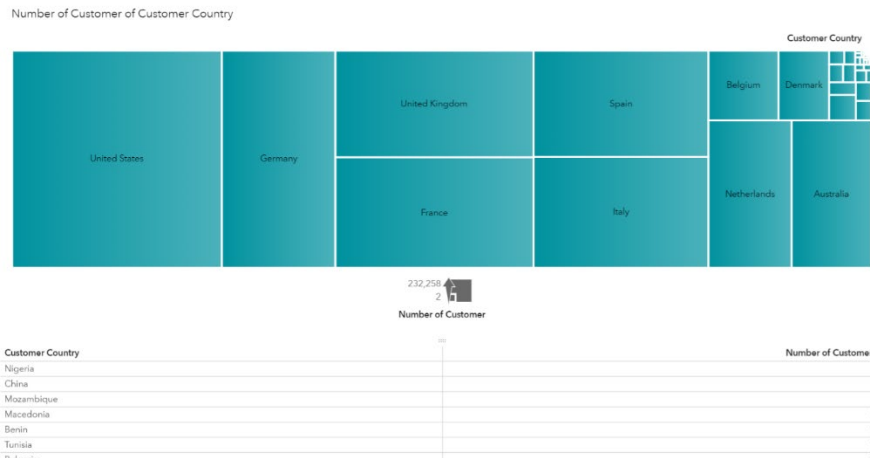


Figure 3. Tree Map for Number of Customer for Customer Country

After that, the analyst should identify which customers are gold members, general members or non-members, with their quantity ordered and profits. The results are shown by Figure 4, there are more than 90% of customers who have membership for the Stellar Peak Sports & Adventure, with 475,770 of gold members (50.8%) and 385,364 of general members (41.15%). The rest of the customers purchase the products via the internet or catalog stores, which has 75,368 customers. In addition, the quantity ordered, and the profits of the products are directly proportional to the group of customers, that is indicated to the number of purchasing members is higher than non-members.

In Figure 4, the customers who are the Stellar Peak Sports & Adventure Club Gold members and general members are purchasing products with the number of 794,936 and 643,831, as well as \$65 million and \$53 million

respectively for profits. And the internet and catalog customers have only 131,495 for quantity ordered and \$11 thousands for profits. Also, Figure 5 displays the plot box for the profits in each customer group, which defines the details of profits with these customers. For example, Stellar Peak Sports & Adventure has gained an average of \$151.52 of profits from the non-member customers, and \$138.78 and \$138.78 of profits from the customers who are gold members or general members.

These figures describe the difference between members and non-members according to the quantity of order and profits (revenues). Most of the profits and revenues of the Stellar Peak Sports & Adventure come from the customer who has membership. The fact indicated that the membership strategy is successful so that customers prefer to become members because that can enjoy a series of benefits and services that non-members do not have. Hence, Stellar Peak Sports & Adventure is able to establish the strategies that can improve the satisfaction of the customers who have membership, or attract other customers to register the members. For example, a company may conduct sales events that have different prices with members and non-members.

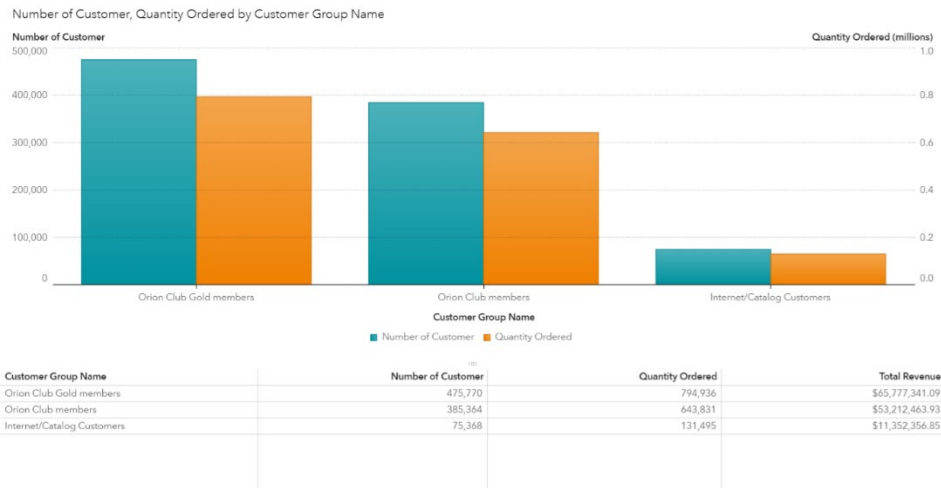


Figure 4. Bar Char for Number of Customer Quantity Ordered by Customer Group Name

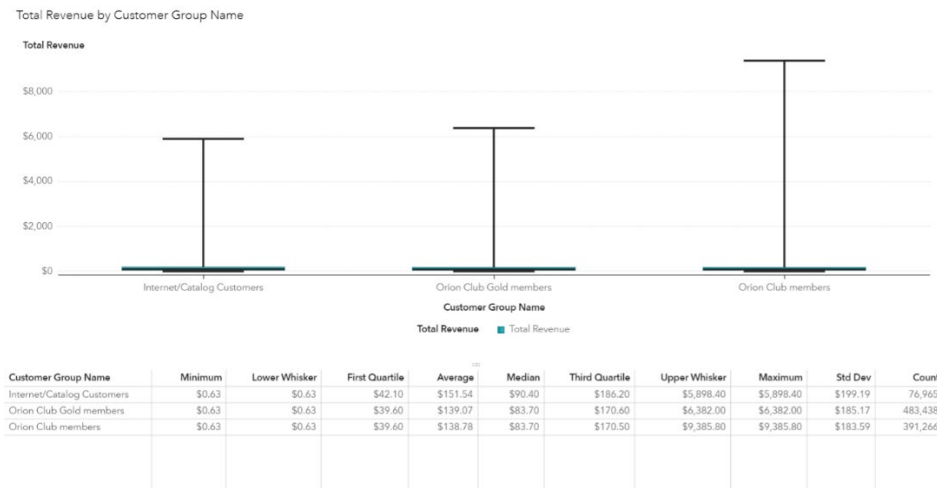


Figure 5. Plotbox for Total Revenue by Customer Group Name

After that, the variety between number of customers and quantity of purchase within 5 years as shown in Figure 6. In terms of customer numbers, there is an increment of numbers from 2012 to 2014, but there was a turning point in 2014 that indicated the number of customers was going down. After January 2015, the number of customers began to pick up until 2016. Also, the quantity ordered of the products between 2012 and 2014 has increased significantly, which is following the increasement of customer numbers, and then started to fall in January 2014. After one year, the quantity also increased with the customer number.

This analysis indicates what are the trends among the customers and quantity ordered. There is significant turning point in the decrease of customer and quantity ordered, which is 2014s. After investigating and researching, some economic events are the factors that directly or indirectly cause the fall of the number of customers and quantity

ordered such as terrorist attacks active in the worldwide. The variety of customer numbers and orders would affect the profits and revenues of the company. Therefore, Stellar Peak Sports & Adventure should prepare some measures to prevent the predictable risk or reduce the losses caused by the unpredictable risk, for example, buy insurance for business or establish risk assessment teams.

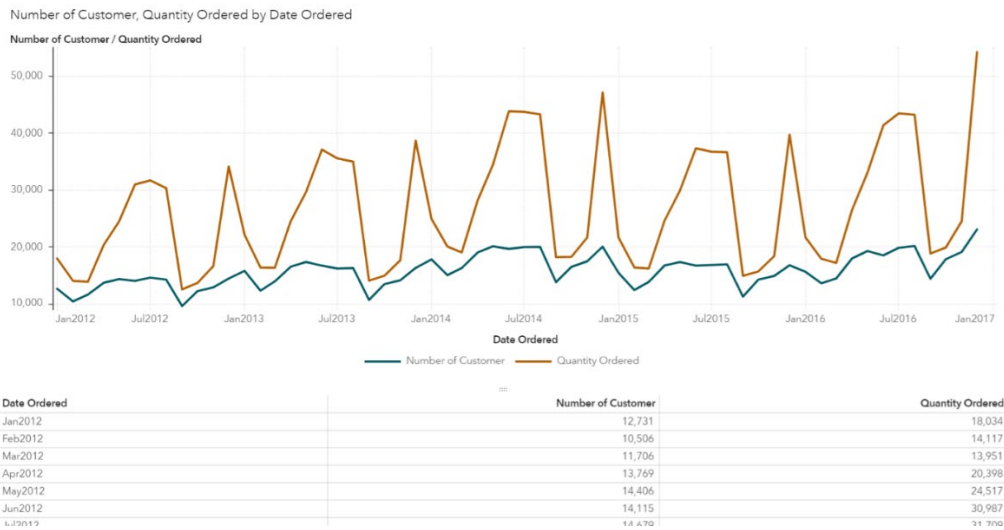


Figure 6. Times Series Plot for Number of Customer, Quantity Ordered by Date Ordered

Figure 7 shows the number of customers between order types and customer groups. According to the visualization information, customers who are the members of Stellar Peak Sports & Adventure Club prefer to purchase in the retail store, that has as high as 397,502 customers and 348,468 respectively to gold members and general members. Compared to retail sales, most of the customers do not like to purchase by using the internet or catalog. However, other customers can only purchase by these two ways, and the catalog sale is the most in the order type, which has 42,125 non-member customers.

The analyst would analyse the tendency of the customer when they purchase the products via this analysis. There is a difference in behaviour between members and non-member customers in purchasing. Stellar Peak Sports & Adventure is able to make different strategies for the member and non-member customer. For example, the company could increase the stock of products in its retail store by increasing the number of purchases or improve the delivery times for two kinds of customers.

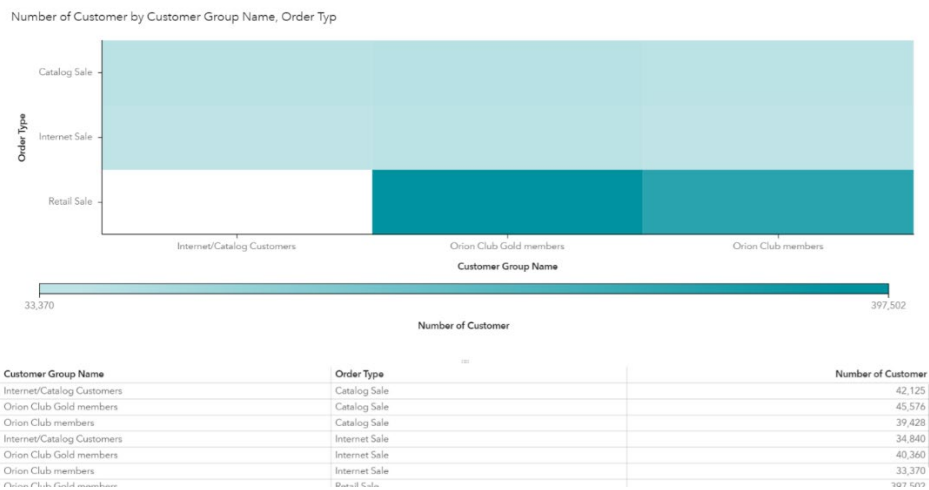


Figure 7. Heat for Number of Customer-by-Customer Group Name, Order Type

Figure 8 shows the number of customers and quantity ordered of products between age groups of customers. The age is calculated based on the birth year of the customer and divided into five groups, which is from 29 and below to 60 and above. According to Figure 8 shown, 295,870 customers are 60 and above, with a total of 496,182 orders. Followed by 248,870 customers aged between 30 to 39 who purchased around 410,000 quantities of products. There



are not such differences between age groups from 40 to 49 and 59 to 59, the number of customers has 166,505 and 165,214 respectively, with around 28k of quantity ordered.

Analysts of the company can define that the core customer age group of the Stellar Peak Sports & Adventure is 30 to 39 group and 60 and above group. The analysis for the customer's age group would help the company to identify and determine the customer segments for establishing its strategies and decision making. For example, Stellar Peak Sports & Adventure is able to conduct different sales events according to the age group which gains the most benefits or finds potential customers.

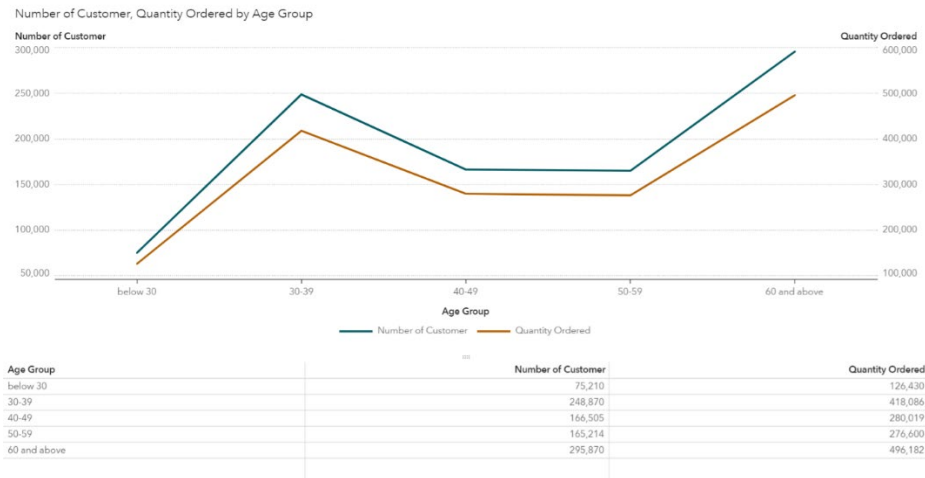


Figure 8. Line for Number of Customer, Quantity Ordered by Age Group

#### 4 Challenges in Implementation

Most organizations are willing to use business analysis for improving its operation and challenges. Business analysis has changed the life of the organization whether it is small to big business. However, any technology would be faced with its own set of challenges and problems. The challenges of business analysis should be understood by organizations in order to assess the risk of using business analysis. Gartner, a global research and advisory firm, said, "Up to 70% of BI implementations end up failing to meet all the business goals." [13].

Business data can be seen by anyone anywhere that will lead to leakages of important information for the business so that competitors can fully understand an organization and make the best strategies. On the other hand, the accuracy of data is vital for performing business analytics which greatly influences the analysis results. Organizations cannot ensure all data is correct when collecting and investigating this data. For example, Stellar Peak Sports & Adventure has collected data about the age of each customer but cannot ensure all customers have reached their correct age. The integrity of data will make business analysts take a failure on their analysis and even advise unused or wrong suggestions in business operations. For example, Stellar Peak Sports & Adventure may develop new products according to the customer segments that are analysed by business analysts, but it fails to gain the most profits due to the analysis going wrong.

In addition, Dursun Delen & Sudha Ram suggest challenges faced by business analytics in terms of analytics talent, culture, return on investment (ROI), data, technology security and privacy [14]. In simply, the business analysts who have the best knowledge about the analysis are scarce in the market, organization hard to transform to smart business due to hard to shift old culture, difficult to identify the ROI, which are the challenges of the business analysis that will be faced by each organization. Hence, the business analyst of Stellar Peak Sports & Adventure should ensure the integrity and accuracy of the customer data and correctly advise the suggestion and report to the company in order to improve its decision making.

#### 5 Conclusion

In conclusion, Stellar Peak Sports & Adventure can define its customer segments through the analysis. The success of business analytics will help companies to make great strategies and understand the trends of customers in order to improve its decision making. For example, a company can conduct sales events with the discount price for the member in order to the number of members. While business analytics provides many benefits to the organization, it will also be subject to some challenges which may cause the operation of the organization to be failed. Stellar Peak Sports & Adventure should pay attention to these risks in order to make a successful strategy in its operating as well as to improve the decision making.

BIBLIOGRAPHY

- [1]. P. Baines, S. Whitehouse, P. Antonetti, and S. Rosengren, "Understanding customer behaviour," *Fundamentals of Marketing*, Jan. 2021. doi:10.1093/hebz/9780198829256.003.0003
- [2]. J. Noverlita and H. Surbakti, "Streamlining stock price analysis: Hadoop ecosystem for Machine Learning Models and big data analytics," *International Journal of Information Technology and Computer Science*, vol. 15, no. 5, pp. 25–34, Oct. 2023. doi:10.5815/ijitcs.2023.05.03
- [3]. N. Ali and O. S. Shabn, "Customer lifetime value (CLV) insights for strategic marketing success and its impact on organizational financial performance," *Cogent Business & Management*, vol. 11, no. 1, Jun. 2024. doi:10.1080/23311975.2024.2361321
- [4]. V. Rao, L. Naveen, S. Mahendher, and P. Kumar, "Strengthening customer data protection in Healthcare: An empirical analysis of data privacy and security measures for Ensuring Customer Information Security," *European Economic Letters*, vol. 14, no. 2, 2024. doi:10.52783/eel.v14i2.1337
- [5]. V. Duong, "Big Data Analytics and business intelligence in Business Marketing: A Review," *International Journal of Information Technology and Computer Science Applications*, vol. 2, no. 3, pp. 139–146, Sep. 2024. doi:10.58776/ijitcsa.v2i3.162
- [6]. N. Nurjayanti and I. Irawati, "The analysis of Students' Self Management at Institute of Technology and business indragiri," *International Conference of Business and Social Sciences*, pp. 1050–1059, Nov. 2024. doi:10.24034/icobuss.v4i1.589
- [7]. C. F. Nourani and A. Stieber, "Digital Transformations Imperatives: Predictive goal processes for Business Model Innovation," *Artificial Intelligence and Computing Logic*, pp. 51–96, Nov. 2021. doi:10.1201/9781003180487-3
- [8]. M. Laguna and J. Marklund, "Prescriptive analytics for process performance optimization," *Business Process Analytics*, pp. 519–566, Jan. 2025. doi:10.1201/9781032617237-10
- [9]. S. Ullah, "The importance of Baaas - business analysis as a service and why it's so important in current climate," *CBI Project Solutions*, <https://cbiprojectsolutions.com/blog/the-importance-of-baaas-business-analysis-as-a-service-and-why-its-so-important-in-current-climate> (accessed Dec. 2, 2024).
- [10]. R. Strauss, "Martech... the Via Dolorosa into data-driven customer interaction," *Data-Driven Customer Engagement*, pp. 1–7, 2024. doi:10.1007/978-3-031-64295-1\_1
- [11]. R. Jackups and M. Zaydman, "'customers like you also ordered ...,'" *American Journal of Clinical Pathology*, vol. 159, no. 2, pp. 106–107, Jan. 2023. doi:10.1093/ajcp/aqac159
- [12]. J. Goldmeier, *Data smart*, Nov. 2023. doi:10.1002/9781394277124
- [13]. S. Negash, "Business intelligence," *Communications of the Association for Information Systems*, vol. 13, 2004. doi:10.17705/1cais.01315
- [14]. H. Yu, "Application of blockchain technology in the Data Processing Security System of Financial Enterprises," *SECURITY AND PRIVACY*, vol. 6, no. 2, Apr. 2022. doi:10.1002/spy2.230