

COVID-19 Impacts: Empirical Studies on Orion Indoor Sports Business Using Visual Analytics

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Abstract

Covid-19 spreads across the world in just a few months and it has caused severe economic consequences to many countries. Many businesses are also affected dramatically due to the lockdown in order to stop the spread. It does not only affect businesses, it affects how consumers behave in buying and shopping as well. Consumers learn to improvise and get used to the new habits. For example, consumers are not allowed to go to the gyms as they are closed during the lockdown, and they start to work out at home. Technology advances has played a big role in helping the consumers to cope in this situation in an innovative way. Some changes done in an organization to adapt to the pandemic can potentially improve their business tremendously and reduce the losses that already exist before the pandemic. For example, gym equipment sales were only targeting business before the pandemic. However, due to the lockdown, many people were left nowhere to work out and they then prefer to buy gym equipment at home. This will increase the demand of gym equipment and thus boosting the fitness industry business. With the advancement of technology, fitness industry can sell their products online easily and they can also view real-time business performance.

Keywords— Covid-19, Pandemic, Indoor Sports Business, Indoor Sports Centre, Gym, Fitness, Data Visualization, Visual Analytics.

1. Introduction

Within a few months, Covid-19 has affected many countries and it has caused a world-wide crisis. Many countries were forced to implement lockdowns and close their borders. We can also see that activities and events were postponed or even cancelled. Restaurants, public swimming pools, and playgrounds were also forced to close their doors. Not only that, many indoor sports centres are also forced to shut down in order to prevent the spread of coronavirus. Bankruptcies are also likely to happen throughout the entire supply chain [1].

Indoor sports centres provide equipment and services for people to carry out physical exercise [1]. People are not moving around the room but remain confined in the particular position of the room to perform the exercise [1]. Sports play a vital role in the society. Sports have undoubtedly brought people together and lead them healthier lifestyles before the pandemic. Even during the Covid-19 pandemic, sports are never being neglected by the society as well [1]. Due to the movement order order, people can no longer visit indoor sports centres as they are closed and this has changed them into working out at home. We can see vividly that the pandemic has changed consumer behaviours too as people are starting to work out from home.

Orion Star Sports & Outdoors is an organization which sells various sports-related products such as outdoors, clothes and shoes. It is also an international business where they have suppliers from different countries and sell their products worldwide too. Their suppliers come from all over world such as Australia, Belgium, Canada and others. They sell their products to countries include Germany, France, United Kingdoms and many more. Orion Star Sports & Outdoors sell 3,151 products and they have 64 suppliers. They also have approximately 68,300 customers that contribute to their 747,953 orders.

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2. Business Issues

COVID-19 pandemic causes many nations to lockdown in order to prevent the spread. This has significantly changed most of the people lifestyles and transformed them into a ‘new normal’. Due to the closure, business has been impacted significantly. Before the pandemic, most fitness equipment is sold to the gyms and fitness studios and suppliers are highly dependent on the gym business. In Orion Star Sports & Outdoors, indoor sports have the least number of orders (11,755) and indoor sports is the second least profitable product category which makes \$160,689.61. Table 1 shows that indoor sports have the least number of orders and Table 2 shows that indoor sports is the second least profitable product category.

Table 1: Product Category sort based on number of orders

Product Category ▲	Number of Orders ▲
Indoor Sports	11,755
Racket Sports	20,589
Swim Sports	20,796
Winter Sports	26,174
Golf	32,270
Team Sports	34,197
Running - Jogging	43,378
Children Sports	71,045
Shoes	106,510
Outdoors	107,616
Assorted Sports Articles	116,267
Clothes	157,356

Table 2: Product Category sort based on profits

Product Category ▲	Profit ▲
Team Sports	\$133,185.52
Indoor Sports	\$160,689.61
Swim Sports	\$244,196.15
Children Sports	\$429,751.38
Assorted Sports Articles	\$461,488.46
Running - Jogging	\$593,334.04
Shoes	\$662,446.58
Golf	\$693,525.86
Racket Sports	\$836,949.47
Winter Sports	\$1,067,262.44
Clothes	\$1,289,492.35
Outdoors	\$1,687,084.95

As the gyms and fitness studios are not allowed to operate, it is also getting more difficult to sell anything but necessities. With people not visiting the gym and fitness studios, these indoor sports products have also left unused in the gyms. As this gym equipment is left unused, it will cause more losses to the organization as it takes a large amount of money to maintain them. According to ABC Fitness Solutions, it costs approximately \$50,000 to over a

million to maintain the facilities [2]. Cleaning supplies such as equipment cleaners also costing the organization too [2].

Moreover, in indoor sports product category, Orion Star Sports & Outdoors also seem to have losses in products such as Letour Mag Plus Bike – Buy Now Paper, Letour Spinner Bike, Letour 757 Home Exerciser and Lift Weights 15 Kg Dumbbell. Table 3 below shows the products details, the losses that they made to the organization as well as the number of orders of the products.

Table 3: Products which are generating losses

Supplier Name	Product Group	Product Name	Quantity	Profit ▲	Number of Orders
TrimSport B.V.	Fitness	Letour Mag Plus Bike-Buy Now Paper	445	(\$31,748.60)	318
TrimSport B.V.	Fitness	Letour Spinner Bike	111	(\$1,745.10)	75
TrimSport B.V.	Fitness	Letour 757 Home Exerciser	44	(\$1,331.50)	31
TrimSport B.V.	Fitness	Lift Weights 15 Kg Dumbbell	363	(\$541.26)	223

The target market for Orion Star Sports & Outdoors can only be gyms and fitness studios because business is more likely to purchase as the sports equipment are big in size and high-priced. It is also very challenging to sell to the householders as it is a big-budget and most of them would prefer to go to the gym. In gym, people pay with much lower prices compared to buying a treadmill with few thousands. They can also get access to various exercise equipment in the gym too.

3. Proposed Solutions

One of the solutions to solve the sales of indoor sports fitness equipment is through selling them online in the website. This is because people are not allowed to do sports outdoors such as going to the parks and stadiums during the lockdown. Being at home and the inability to go outside or visit gyms do not mean that they cannot stay active. This will turn many people to buy indoor fitness equipment to work out at home as movement order controls are implemented. Hence, suppliers have to be prepared to keep up with the demand and customer’s needs.

According to the Times of India, sales for dumbbells and bikes were doubled since the lockdown compared to pre-Covid months at Decathlon, a sporting goods retailer [3]. The fitness company, Beachbody, has also reported that there is an increase of 200% growth in their subscribers as they start doing online classes, livestreams and conduct personal training sessions through Zoom [4]. Although it is seen that the demand of gym equipment is high, Orion Star Sports & Outdoors should also consider the needs of customers in order to increase their sales too. For example, they can suggest their suppliers to modify their products and manufacture them in a more convenient and portable way. With this, it will save costs for the shipping costs and easier for the customers to move them around. The equipment can also be modified into an easy-to-store and multi-functional equipment. Hence, customers do not have to buy multiple gym equipment, but a gym equipment which they can do multiple exercise. By selling them online, the data is also easier to be collected and tracked. Business analytics will be able to tell the organization how much they have sold, profits gained and they can get new insights from the report generated too. Hence, it will increase the efficiency of the organization in handling their organization.

Besides, gyms and fitness studios can also consider renting out their gym equipment in their website. They can either charge the customers for the rentals or provide a limited time to rent for customers in order to maintain their active membership in the gym. Moreover, organization can also apply business analytics to keep track of the number of fitness equipment available, profits made from the rented-out equipment as well as the profits from selling the fitness equipment. For example, Orion Star Sports & Outdoors can generate report using SAS Visual Analytics and see which fitness equipment is not popular among the customers and which one is generating a loss. If the product is not popular among the consumers, they can immediately make decisions in order to keep their losses minimal. SAS Visual Analytics provide interactive dashboards, reports, business intelligence and analytics as this can definitely help the organization to oversee their business growth in the future [5].

4. Results and Discussion



Figure 1 Dashboard of Indoor Sports Business

Figure 2 below shows the overview about the product categories that are sold by Orion Star Sports & Outdoors.



Figure 2 Profit and Quantity by Product Category

Figure 3 below shows that in Orion Star Sports & Outdoors, indoor sports product category is at an alarming state as indoor sports have the least frequency and number of orders among the other product categories. With this visualization, we can also see that indoor sports are generating the second least profits among the other product categories as well. With this visualization, Orion Star Sports & Outdoors should focus more on the indoor sports product category, and particularly in fitness as they as generating losses to the organization.

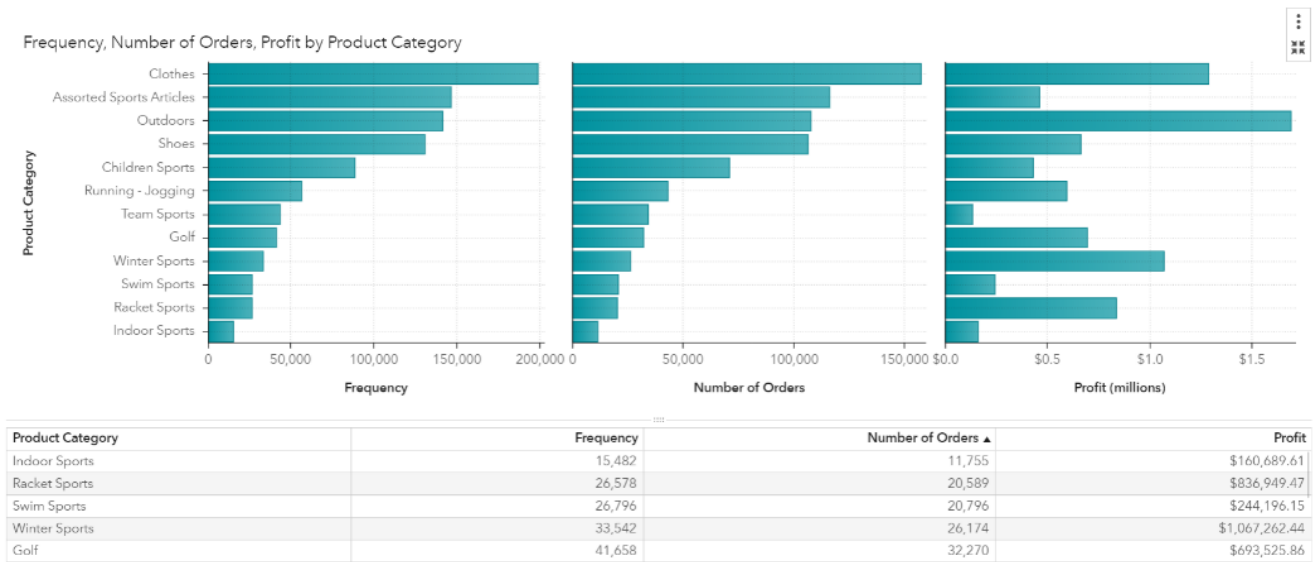


Figure 3 Result about product category, frequency, number of orders and profits.

Figure 4 below shows that in indoor sports, fitness products are generating a loss. Hence, we should focus more on the fitness product group and reduce the loss as soon as possible. From the bar chart, we can also see that gymnastic clothing and top trim in indoor sports are generating a lot of profits to Orion Star Sports & Outdoors and they may want to purchase more from suppliers in order to meet the consumer’s demands as they are generating high profits to the business. During the pandemic, fitness products may increase as people are starting to work out at home. Orion Star Sports & Outdoors may consider making changes to the retail price so that more people can afford to buy the equipment during the tough times in pandemic. Not only it will increase the number of orders, it will also reduce the losses to the organization too.

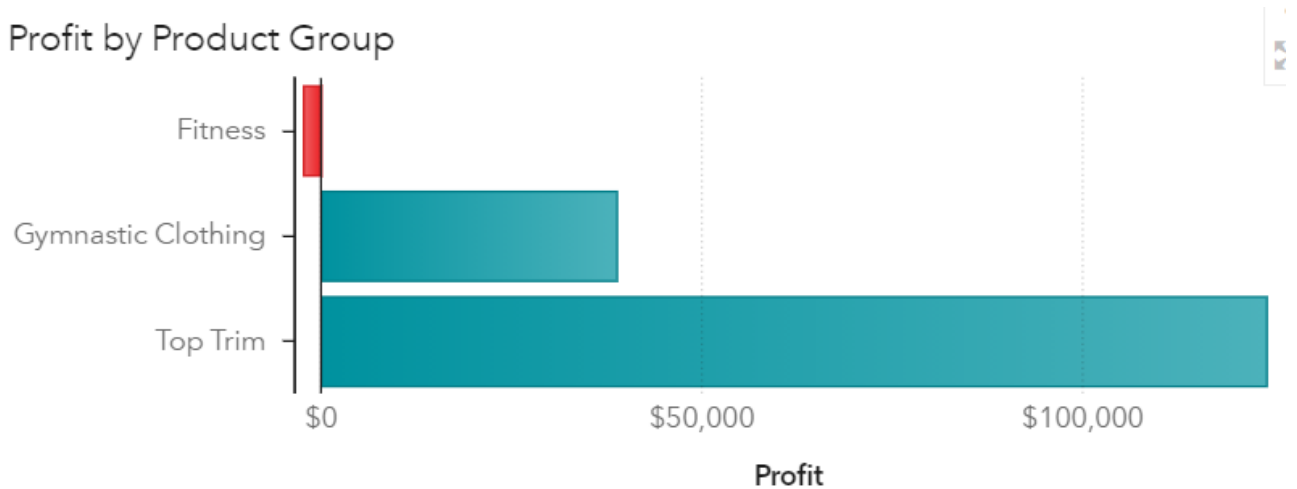


Figure 4 Profit of indoor sports

Figure 5 below shows that fitness products in indoor sports, product Letour Mag Plus Bike-Buy Now Paper, Letour Spinner Bike, Letour 757 Home Exerciser, and Lift Weights 15 Kg Dumbbell generate loss to Orion Star Sports & Outdoors. The loss might be due to the high costs of the products themselves. With this visualization created, Orion Star Sports & Outdoors can know which products in particular are generating loss and reduce the loss as soon as possible. Orion Star Sports & Outdoors may consider changing different products with lower costs and therefore the retail price can be more affordable to the consumers. Covid-19 pandemic has caused economic downturn and it has surely transformed consumer spending habits. According to a survey done by Bank of America, it is found that there are approximately two-thirds of Americans, which is equivalent to 64% of Americans, have changed their spending habits since the pandemic started [6]. Even when the consumers have the intention to buy before the pandemic, they will lose the interest to buy in order to manage their budget since the pandemic causes many people to be unemployed.

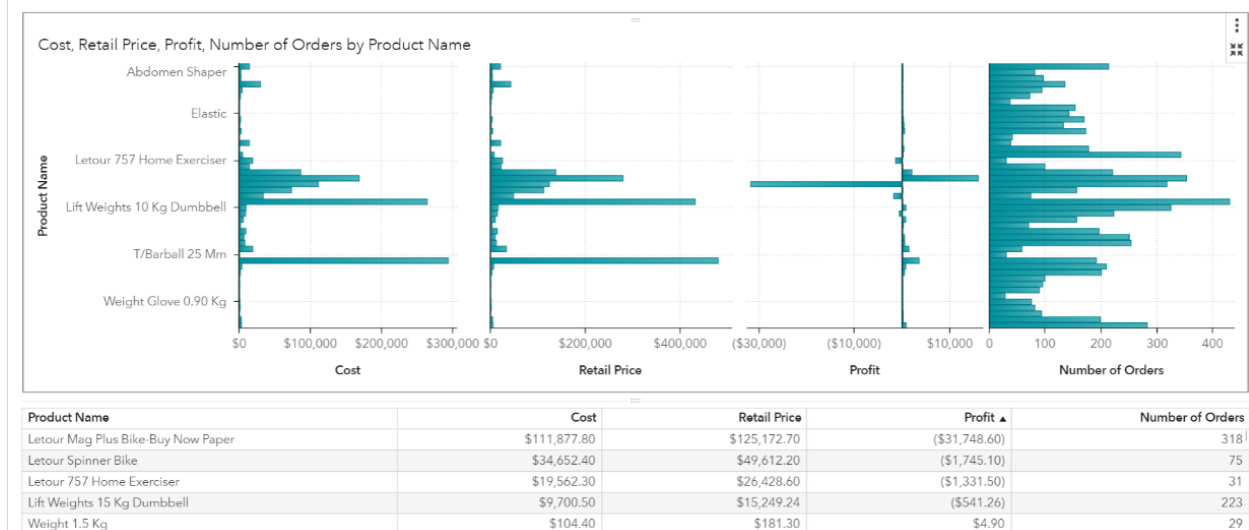


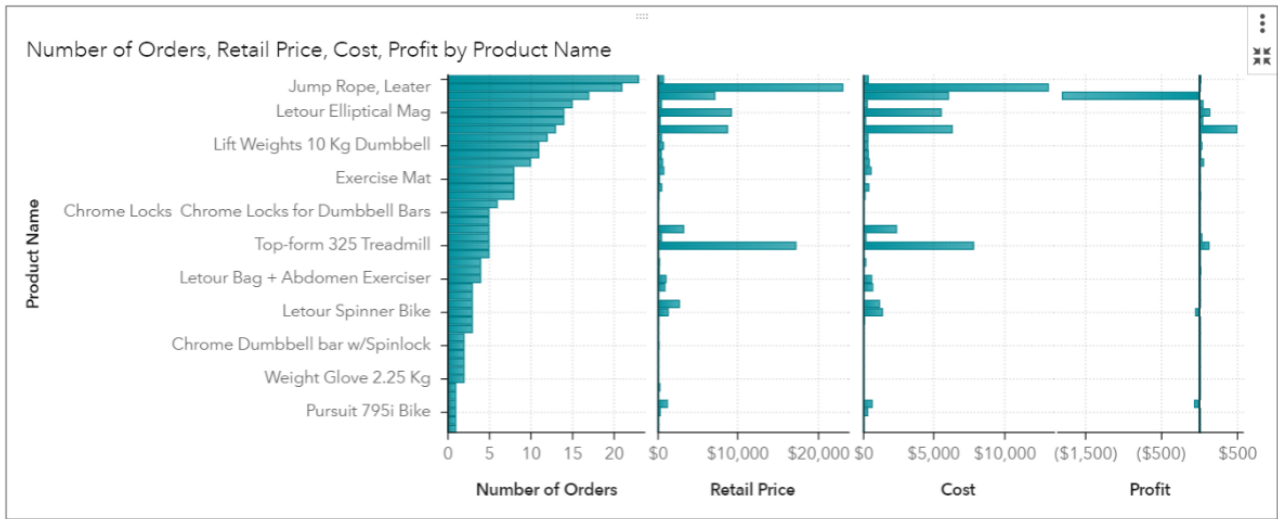
Figure 5 Result about product, cost, retail price and profit

Figure 6 shows that Madrid has the highest number of orders followed by Milano and Paris. Although these cities have the highest number of orders, it does not necessarily mean that they contribute to the highest profits (as shown in Figure 8). This may be because people in Madrid, Milano and Paris tend to buy fitness products that only generate a few profits to the organization (as proved in Figure 7). With this bar chart created, Orion Star Sports & Outdoors can know where the majority of orders of fitness come from and focus on the cities that are placing high number of orders. If they sell their products online, they may also consider increase the traffic in the website so that it is faster for the consumers to purchase a product.



Figure 6 Result of the cities in which fitness products have the high number of orders

Figure 7 shows that in Madrid, the product that has the highest number of orders is Letour Trimag Bike. It is only generating \$3.70 profits to the organization. Orion Star Sports & Outdoors may consider making the decision to slightly increase the profits made from Letour Trimag Bike since there are still a number of orders from the customers. With these bar charts created, Orion Star Sports & Outdoors can know that which products have the high number of orders in Madrid, as Madrid has the highest number of orders from their consumers.



Product Name	Number of Orders	Retail Price ▼	Cost	Profit
Letour Trimag Bike	21	\$22,998.40	\$13,012.50	\$3.70
Top-form 325 Treadmill	5	\$17,167.00	\$7,765.60	\$128.40
Letour Elliptical Mag	14	\$9,153.20	\$5,487.70	\$138.10
Letour Heart Bike	13	\$8,685.30	\$6,264.10	\$496.60
Letour Mag Plus Bike-Buy Now Paper	17	\$7,111.90	\$5,998.10	(\$1,803.50)

Figure 7 Result of the fitness products in Madrid (product name, number of orders, retail price, cost and profit).

Figure 8 below shows that London contributes to the highest profits to fitness products. This may be caused by it is a big city where people can afford more on costly equipment. Hence, in big cities, Orion Star Sports & Outdoors can consider selling more products that are more expensive in London compared to the other cities. If the organization starts to sell their products online, the sales can also increase as more people are staying at home and purchase online. With this bar chart, Orion Star Sports & Outdoors can know which cities are contributing the profits to the organization in fitness field.

Top 10 Cities by Profit

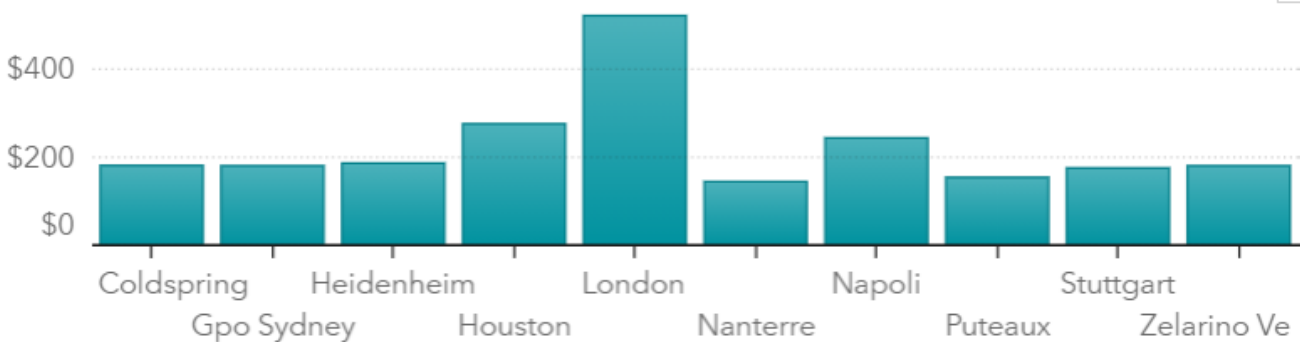


Figure 8 Result of the cities in which fitness products are generating profits

Figure 9 shows that highest number of orders does not necessarily mean that it will generate highest profits to the organization. Hence, Orion Star Sports & Outdoors should focus more on the products that are generating profits so that the business will gain more revenue. If Orion Star Sports & Outdoors would like to sustain their consumers, they can also try to provide promotions to their customers who always make orders from them.

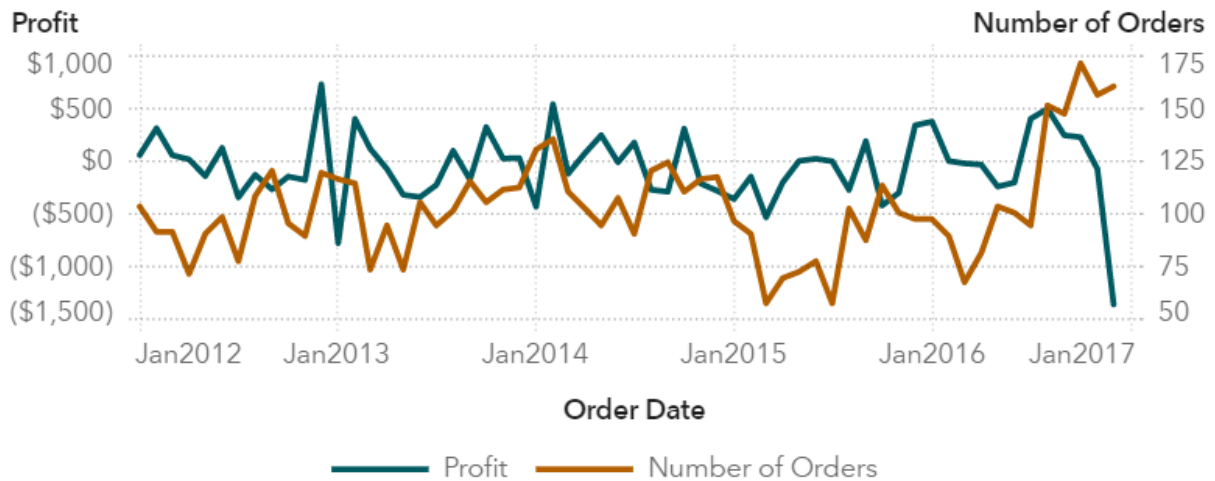


Figure 9 Result of the profit and number of orders in fitness products before the pandemic

Dashboard can help in decision making as they provide real-time results from the collected data [7]. Orion Star Sports & Outdoors can easily view their business performance and spot the issues immediately on the dashboard [7]. It also reduces reporting time and dashboard can gather data from different sources and combine them in an interface [7]. Moreover, dashboards are also interactive and dynamic, and users can view the data based on their filters and make changes when necessary [7].

Challenges in Implementation

One of the challenges that Orion Star Sports & Outdoors might face in the development and implementation is that there will be a large volume of data to be stored. The data will be increasing over the years and hence Orion Star Sports & Outdoors has to analyze the generated data and get useful insights immediately. Moreover, with the massive data, most of them comes in unstructured form such as documents, videos and photos. This will make it difficult to be searched and analyzed, and it takes up a lot of space [8]. Combining the unstructured and inconsistent data from various sources will also encounter errors and hence affecting the data quality. Therefore, Orion Star Sports & Outdoors has to utilize technologies such as tiering, compression and deduplication in order to reduce the amount of space used to store the data [8].

Another challenge that might be faced by Orion Star Sports & Outdoors is to recruit professionals or skilled talent. Orion Star Sports & Outdoors may find it challenging to retain and recruit professionals who can handle and utilize their data to get useful insights from SAS Visual Analytics. According to 2017's Robert Half Technology Salary Guide, it is found that there is a high increase of pay for positions such as data scientists and business analysts all over the world [8]. Some companies are also training their employees to learn the tools and techniques to handle their data [8]. Hence, Orion Star Sports & Outdoors may have to invest more in hiring professionals and training their employees. On the other hand, there are actually a lot of firms that only deal with data analytics and the associated operations. If Orion Star Sports & Outdoors are unable to find a suitable one for their organization, they can also consult them and achieve their data needs. These firms also have the expertise and skills needed to accomplish the tasks. Moreover, it is also more economical for Orion Star Sports & Outdoors to outsource the work to another firm compared to setting up an entire section in the organization.

Moreover, with the massive amount of data generated, Orion Star Sports & Outdoors may also concern about their data governance. Usually organizations will have a group of people to set their data government policies as well as validating the data [7] [8]. For example, the address of the particular customer in indoor sports record may be different from that in outdoors. This will create a confusion and the organization will have to validate the data and find out which one is the correct address and then remove the inconsistencies when storing data. Hence, Orion Star Sports & Outdoors can manage the data redundancy by developing machine learning algorithms or artificial intelligence based technologies.

5. Conclusion

In conclusion, Orion Star Sports & Outdoors can easily and immediately identify the alarming issues happening in their organization through visual analytics. SAS Visual Analytics provides an interactive and simple platform for users to analyze their data. Covid-19 changes consumer behaviors and that has impacted indoor sports

business especially in their equipment sales. Orion Star Sports & Outdoors may continue to analyse their data through the dashboard and view how Covid-19 changes their business. Orion Star Sports & Outdoors should also manage their business in a different approach in order to meet the needs of their consumers during the pandemic. They also have to make use of the technologies such as data analytics in handling their business as we can see that everything is now data-driven. The data generated also provides useful insights to the organization and help them in decision-making as well as boosting their business. However, in implementing and developing data analytics, many problems may arise. For every problem, there is always a solution and solving them will definitely bring optimum results for the business.

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