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Analysis of Data on Small Retail Stores

MSBA 305

Business Intelligence

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Introduction

This report will be an analysis of data which was acquired from an unnamed small business which has been dealing with the coronavirus (COVID-19) pandemic. Data was provided in a three-year-period, from January 2017 to December 2019, which measured sales, discounts, and kinds of products customers bought as part of the business's interactions, providing a greater emphasis on online sales despite having some form of a physical store location (Morse, 2020). The usage of key performance indicators (KPIs) and other measurements of successes and failures will be focused on to have a better understanding for what this small business should consider acting on after the pandemic.

This analysis using business intelligence (BI) will be compared to another middle-to-larger scale retail store which is a shorter period, from January 2020 to June 2021, which has dealt with the COVID-19 pandemic. The other retail store's data-driven trends and decisions that that business took to find profit during adverse times helped it to recover from some of the losses from the lockdowns, restrictions, or the steep decline in foot traffic into the actual store. Despite online or catalog sales, assessing how much of an increase in losses would also be an indicator of the kinds of sacrifices that the business would have to make to stay afloat. This can be due to many different factors such as keeping up with rent or utilities fees or getting enough equipment for maintaining the health and safety of customers and employees, among others. Finding profit in dire times for small retail stores could only be done if enough money beforehand was saved, which might not always be the situation that any small or family-owned business has in mind.

A small business was chosen for this case analysis because entrepreneurship and innovation have been trending in markets such as the United States, Canada, Europe, and Asia, among others, with the usage of technology. A small business does not just help a larger-scale economy generate money, but it helps smaller, more local economies grow too, and encourage community development by hiring local workers wherever possible (Brown, 2018). Especially in retail, some companies are making the push to have online services and have that extra level of flexibility in gaining sales outside of brick-and-mortar stores they have. Since there are different high potential opportunities to profit via the Internet, new ideas will continue to grow even after online capabilities do more than document sales, customers, or the number of deliveries to a store or to someone's house. There is a wide range of possibilities that are opened because of

online retail, but especially with smaller businesses, there is no limit on how much it can grow over time as it finds different ways to navigate customers.

Data from other small stores taken up to five years after the great recession of the period from May 2007 to October 2009 will be used to provide a better understanding of what the unnamed business should consider doing to better appeal to customers and maximize profit opportunities wherever possible. The desired use case for these datasets will be to find the strengths and weaknesses of the small business to strategize a recovery plan that will allow it to rehire some of its former employees and get more customers to have interest in the store and have them buy from there, be it from in-person and online sales. Comparisons will be made with additional datasets from another retail company before and during the pandemic, to further develop this plan for recovery.

The business intelligence tools that will be used to get analysis and insights from these datasets include MicroStrategy and Microsoft Power BI. Both applications have different capabilities for managing and visualizing data and have unique methods of presenting data that is uploaded into both of their systems. With some initial practice and information about the usage of both BI tools, both are viable applications that are user-friendly. Both have the goal of navigating insights that might be useful for data in terms of trends, overall analysis, and presentation of the data through dashboards to users' likening. This will result in suggesting more calculated risks or prescriptive thinking, which would result in more informed decision making for any company. Just as it would be the case for a corporation or a larger company with an executive board, stakeholders, and a larger, wider quantity of employees, the case is made the same for small businesses to take this track of data-driven decisions.

For clarity purposes, the datasets acquired from two different retail stores were unnamed where their location(s) were not provided. The small retail dataset first mentioned in this analysis will be identified as Retail Store A or "Store A", and the latter retail dataset with more information and characteristics will be identified as Retail Store B or "Store B".

Context of Data

As mentioned in the introduction, the primary dataset comes from online sales from a small retail store, which does have a brick-and-mortar store, but it is not stated where it is physically located at in the United States. Both the name of this store and its location are not listed, but the company last had twenty-five employees before cutting down to only five employees. This was done in part due to the COVID-19 pandemic, which was officially declared a global pandemic by the World Health Organization on March 11, 2020 (Cucinotta & Vanelli 2020, p.157). Without any formal medicine nor any set plan to curb the spread of the virus, many stores and businesses that focused on person-to-person communication and investment were left confused as to what would happen next for them. This small retail store was forced to make this tough decision just to remain open for those who wanted to buy from them, hoping that it would soon return to their financial prosperity from the beginning of 2017 to the end of 2019.

This unnamed small business asked for help in a time when there were people in such situations that need some just to simply stay afloat. Having just laid off 20 employees, or 80 percent of their workforce, was not a favorable event for this store. As stated by the author of the Kaggle dataset, the reason the data was put out there so that someone would be inspired to help this small retail store "in anyway [*sic*] possible" (Morse, 2020). While there are larger-sized companies with more money to work with, more employees that can be retained, and more flexibility of how and where they work, for these smaller businesses, there may lack any extra money in their budget to maintain their current standing whenever there are financial conditions well against them. Thus, to remain open and remain functioning as a business for any customers willing to continue investing their money in their products, such sacrifices had to be made to keep these functions as they are and have been.

The pandemic has shown the social and economic disadvantages between smaller businesses and larger businesses and corporations around the world. Owners, managers, and employees were forced to make key personal or tough financial sacrifices to keep their own businesses afloat. There were some fears about how their stores could not be suited to takeout or pickup orders due to lockdowns, while others overall felt that any relief provided by the federal government might not help enough for themselves and their workers (Bartik, Bertrand, Cullen, Glaeser, Luca, & Stanton, 2020, p. 17656). It should be known that 48 percent, or nearly half, of employees working in small businesses, contribute heavily to the United States economy as they

continue to recover from any restrictions or disruptions due to the pandemic (Bartik, et al, 2020, p. 17657). This has been evident by many small or family-owned restaurants and stores having to shut down due to rising costs, lack of a flexible budget to retain current employees or a rise in cases from the virus. Because of the fragility of their assets and other external factors out of their control, the point of resolution for these small businesses that require communication and other forms of interaction with customers should be to reduce interruptions and costs wherever it can be deemed possible to do so. There is the hope to provide more assistance to these businesses on top of the minimal financial support they have currently been receiving to survive.

The simplicity of the data, which consists of two CSV files of online retail sales, provided a few opportunities to provide some simple metrics that could be helpful to increase the number of employees from the five remaining during the pandemic. Because the data from this small retail store had some focus on the online aspects all their business, finding ways to attract more attention for this small retail store with their current physical location would have some costs against the store just to stay open and have enough staff onsite. However, in the long run, it could help the store have more opportunities to gain more customers despite the sales they have already made online. That unidentified location of their store also will present their products for customers who regularly had shopped there often prior to the pandemic and continue to maintain their relationships and investments just as they have been doing in the past.

Approach to Analysis

The small business data was acquired from a Kaggle dataset of data from January 2017 to December 2019 (Morse, 2020). There were multiple components of the dataset as there contained CSV files on inventory categories, sales, returns, and discounts to customers. Since this data involved an online retail store, most of the sales data that were in these files came from online orders. It would be expected that both during and after the widespread stages of the current global pandemic that overall sales and orders would likely increase regardless of the performance of a brick-and-mortar retail store for customers to physically see products they would like to buy.

The following BI tools that will be used for analysis of the data and for insights are MicroStrategy and Microsoft Power BI. MicroStrategy was helpful for the data for the small retail store because it had fewer columns, while Power BI was helpful for data with more columns because the imported data from spreadsheets, CSV files, and other file types or access points, could be seen in their original form within the application. Such was helpful for comparison data which contained more columns as that data was used to accompany the small retail data primarily being used for this analysis. The first analysis will be using descriptive statistics from the unnamed retail store.

That first phase of data analysis will be used in comparisons to datasets from other retail stores which also dealt with sales and costs, but from different time periods. Navigating similarities and differences of different adverse or favorable financial conditions as well as maintaining those customer bases are to be analyzed. All the information will describe the overall performance of the company over the last three years and check if there were any kinds of positive or negative trends across different categories for this retail store. Such insights from other retail datasets can help prescribe the targeted profit and cost numbers that the small retail store may have to achieve to for any hope of returning to its successes that were achieved from 2017 to 2019. Finding out what other retail stores have initialized to measure performance or improve their standing with customers would be provided for the small retail store to consider implementing or making its own decisions on further outreach to customers locally and afar.

We will look at a dataset of another retail store have some understanding of where the small business can stand and find success in the future. This dataset contains orders from customers from January 2020 to June 2021 to better determine guidelines for costs and profits of

the small retail store. It would help it continue its survival and return to its initial financial prosperity from 2017 to 2019, just before the pandemic shut down or cut off many capabilities of small businesses, especially businesses which emphasize direct physical store-to-customer transactions and investments.

In the end, the datasets that will be analyzed using different business intelligence applications will help this small retail store enhance its overall sales. While they have prioritized their online sales of their products, their brick-and-mortar sales should also see improvements in the future. There will be solutions provided based on what this small retail business is lacking and how to make up for what was lost or never had before. It will help find more ways to navigate a new customer base, and better find ways to communicate and retain the current customers that have supported and invested in their store before the pandemic.

Key Performance Indicators of Focus

There will be key performance indicators (KPIs) in use for this analysis to better understand the data and to even provide prescriptive analysis on what the small retail store should do to return to the levels of revenue and financial standings after a pandemic. These metrics will measure the performance of Retail Store A and find what other measurement forms may be lacking to better assess current and future success based on the most important factors that keep the business running (*KPIs and the logic*, 2015, p. 3). This would help provide the store with a more robust plan in place despite most of the sales being done through transactions online through their site. It would also help the store find out how many more employees they could possibly hire back or even hire new employees in response to a higher number of customers physically returning to or visiting stores in the remote future.

Revenue is the first important key performance indicator for this company to consider as it recovers from a pandemic which required cuts in sales and overall revenue. The revenue growth rate is an important key performance indicator that can display a company's potential because of the increased transactions and purchasing of products that had customers paying for all the items or services they felt were useful or satisfying for their wants or needs. Managing how to calculate this metric can come from a variety of factors, including inflation, changes in consumer behavior, and how that company gauges its prices on all its products (Reynders, 2021).

Based on these different social and economic factors, many conditions can change at any time. Any company is responsible for their own decisions for the changes they need to make to better support customers' and employees' needs while also maintaining competitive prices and keeping down costs wherever possible. These expected deliverables are part of supply and demand, especially in retail, where different stores selling different kinds of products, where customers are their primary focus to sell them their products at that one store instead of them going elsewhere to get what they wanted or needed.

A second key performance indicator needed for this small retail store will be customer retention. This metric is based on the number of customers that do return to the store they last shopped at to continue to buy that store's products, or, how they "attract and maintain" and strengthen strategies to their customers' needs (Damen, 2021). It may be hard to gather such data in terms of physical visits to a retail store, but it still can be made possible because of online sales. Such information was not provided in Retail Store A but could be found in Retail Store B. This would be used to model how Store A receives all revenue despite having focused on online sales that have gradually increased in the last three calendar years. This KPI could prove helpful for Store A if it is lacking the information to understand their customers' behavior and attitudes to their store, their brand, and the products and prices offered.

The third KPI for this small retail store is customer churn, which is another metric that is heavily stressed in the retail industry. Lee, Dhandhania, & Doi (2021) define that customer churn focuses on how much retention of people can be made possible; in the context of a hands-on business environment, the retention of current customers who invest in the company after one or a series of purchases (p. 5). This metric would be used as the rate of purchases that were made over a specified amount of time. In the event where this retail store encounters another financial or health-related crisis, a plan can be created off customer churn where there still exists some profitability despite higher costs to pay and any restrictions that would physically separate consumers from the retail company or companies they buy from.

Literature Review

This analysis of what performance indicators that small retail-oriented businesses would not be possible without understanding how other companies have used these metrics to analyze overall performance. Such would be helpful for these companies to determine the decisions and/or the changes that should or should not be made for the company to maintain current financial success or find ways to maximize return on investment wherever possible. Covering what businesses typically have used to measure successes and failures help determine which direction(s) a company will have to move. What decisions the leaders of that company make should be data-driven and based off trends and how their overall performance is or is not lined up with the company vision.

Especially in the retail industry, the primary source of knowing what companies should do now or in the future relies heavily on how they support their customers. The first emphasized key performance indicator is customer churn, where a company has opportunities to have customers return to their products or services at another time (Lee, Dhandhania, & Doi, 2021, p. 20). Customer retention rates should remain high so that a company has some guidance on maximizing their future value as well as their purchases. Understanding what exactly customers have bought in the past three months or analyzing current strategies to retain these customers are important factors in churn. The components of customer churn and retention research focus on analysis of the customers' future value and their purchasing probability, and how the company can better strategize around that one person or group of customers to buy their products, and possibly even get a few of their friends to invest in that same retail store as well.

Next, the reason for this analysis on small businesses was to help bring to light why small businesses are essential to a country's economy, wherever it may be, and not necessarily countries such as the United States. Unfortunately, while small business owners were hopeful for their company's future in the long-term, the lack of sufficient cash starting in March 2020, the start of the pandemic, resulted in dilemmas that forced owners to choose among one of the following: keep all staff and pay them, have enough left over to pay for expenses or debts, or to save the remaining money, if any was available, and put it away for the company's future (Bartik et al, 2020, p. 17662). During these trying times, 43 percent of small businesses in the United States were forced, at minimum, to close temporarily, with about one-third of those businesses considering permanently shutting down (Bartik et al, 2020, p. 17666). Because of lockdowns at

the start of the pandemic in the US starting in mid-to-late March 2020, the connection between customers and employees as a primary line of communication was effectively cut off to reduce the spread of COVID in many public spaces. This negatively affected restaurant and food services, education, industrial work, and the retail field, which is of focus for this analysis. For Retail Store A, the small business of focus in this study, one of the abrupt but necessary decisions management had to make was to lay off a large portion of their workforce. In these situations, any costs, expenses, or other debts overran profit fewer to no customers around to support and make sure they liked the products they wanted to buy.

Furthermore, a store's profits are calculated based off the total revenue over a certain period minus the total costs of that period. In any business, net profit is the money remaining after all costs and payments have been accounted for, which can be recorded in any period (Marr, 2012, p. 3). Companies can have net gain profits at times but can also have net loss profits if money is lost or spent on essentials. It would be expected that in the event of a public health crisis, that these stores would have to spend money on all types of protective equipment to keep its employees safe to choose "honesty and humanity" and protecting essential workers and people that have worked with the public since the beginning of the pandemic (Talieh, 2020). They would also need enough money required to pay for the property's rent, paying the employees, and getting the resources and products needed to keep the business open, functioning, and safe for all its customers. All of this would be to promote the supportive working and business environment despite unforeseen public health circumstances that have changed retail into a different appearance than it was then. A benefit of all of this is taking advantage of technology making recommendations and supporting customers when stores limited people coming in, where businesses hone the opportunity to enhance their online capabilities to reach out to customers.

Cost-benefit analysis is an important metric for any business because it helps its employees understand how much would be spent or gained based on the decisions that are made on a project or a set of targets or goals (Stobierski, 2019). Any kind of retail store will have experienced many different types of costs over time. Direct costs can include profit losses, spending on enhancing the retail workplace, or discounts to customers, while indirect costs include monthly fees, rent, or utilities (Stobierski, 2019). The company and its employees still need to be financially supported for their work and any kinds of benefits that might ensue. The

owner and/or the manager of that company is required to pay for the lease of its location(s) as well as any taxes on the profit that it has made.

Discoveries from Small Business Dataset

The data from the business of three-year period from 2017 to 2019 showed that gross sales by year continued to increase per year. The maximum gross sales were reached in 2019, where the value was $143,762. This retail business had been doing popular because of the sales that it was getting. The online retail store experienced gross sales which increased year after year from 2017 to 2019. The visualization shown from a MicroStrategy dashboard showed how despite different conditions, it still would be possible for this small retail store to maintain some level of success despite many hard losses.

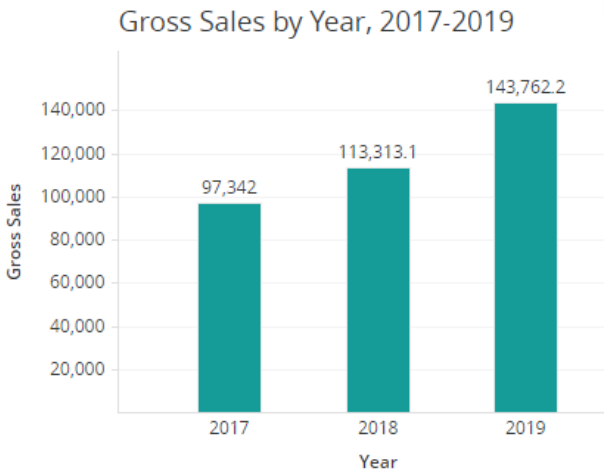


Figure 1. Gross sales of retail store by year, 2017–2019.

The next page breaks down the total monthly gross sales. Store A had the most gross sales during the months of November and December, but the least gross sales during the months of February and October, as there are fewer holidays within each of these months that often center around gift giving to others. It is usually during those two months of gift giving that the store experienced a more active retail environment than in the other months of the year. The month with the third most gross sales was June, since June has not only Father's Day but also the first day of the Summer Equinox, which usually occurs about a week before the end of that

month. Nicer, warmer weather and longer days with sunlight was a reason June's gross sales were third to November (second most) and December, which had the most in sales.

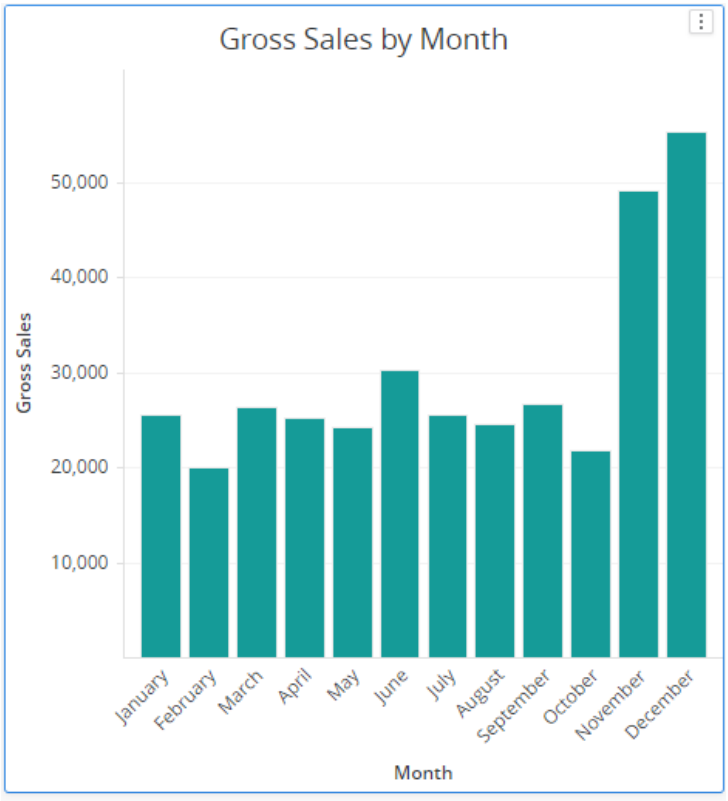


Figure 2. Total monthly gross sales in three-year period.

When analyzing the gross sales by month, November and December were the months with the most sales. Understandably, Fall and Winter holiday seasons such as Thanksgiving, Hanukkah, Christmas, Kwanzaa, and the New Year, among other holidays, would have the store expect the most sales as customers look and shop for gifts. With more retail being done online, these two months would be the most popular in terms of the best values and the most web traffic to search for and purchase the items these people want to get.

There were, however, customers that preferred physically visiting stores to see the items they would like to buy and make decisions on if they wanted to buy something because they saw the products firsthand, not always relying on what they appeared like online on the store's website. Note that the visualization above shows the combined gross sales in the three-year-period where results would have likely remained similar if the average gross sales were taken for

those three years. With Store A having focused more on these online sales instead of retail, there appeared to be a plan already in place for customers to get their orders without hassles, but no information was provided on exactly how they received it.

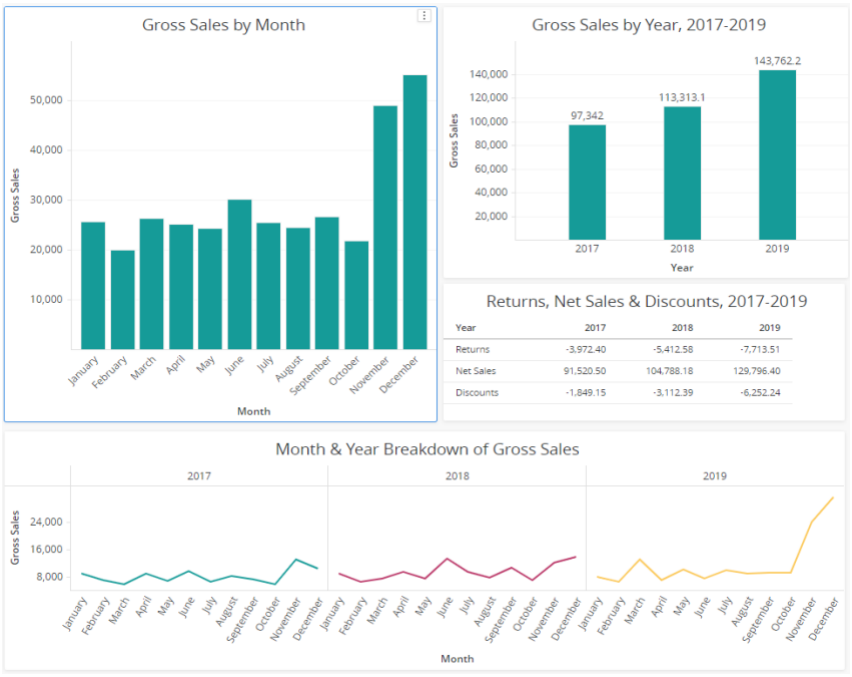


Figure 3. Dashboard showing monthly and yearly breakdown gross sales.

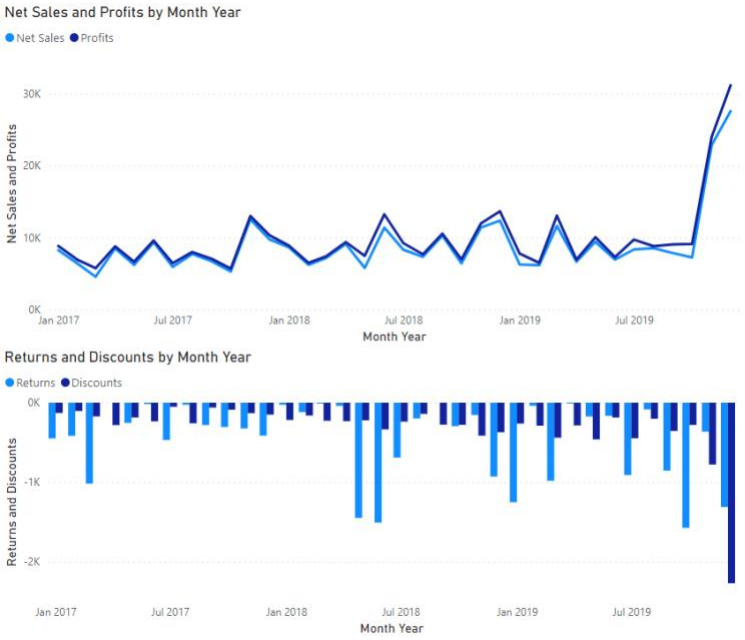


Figure 4. Returns, discounts, net sales, and profits by month and year.

Figures 3 and 4 showed the first two visualizations but with more context. 2019 saw the most in terms of gross sales for this retail store. When broken down by month, most of the sales in that year 2019, experienced the highest gross sales in November and December. Peak gross sales based on this three-year period showed that December 2019 was the month with the highest said value. The years of 2017 and 2018 saw some minimal changes in terms of the monthly gross sales, but the company experienced its highest potential at the most monthly gross sales in the months of November and December. There were small increases in 2017 and 2018 for those two months, but 2019's gross sales in November and December were an at least 33% increase from the previous years in each of the two months. 2019's yearly gross sales were a 25% increase from that of 2018, going from $113,000 in the year 2018 and ending at $143,000 at the end of the year 2019. Store A appeared to have a good plan despite the little information on supporting customers, employees, and any of their interactions as it headed into the year 2020.

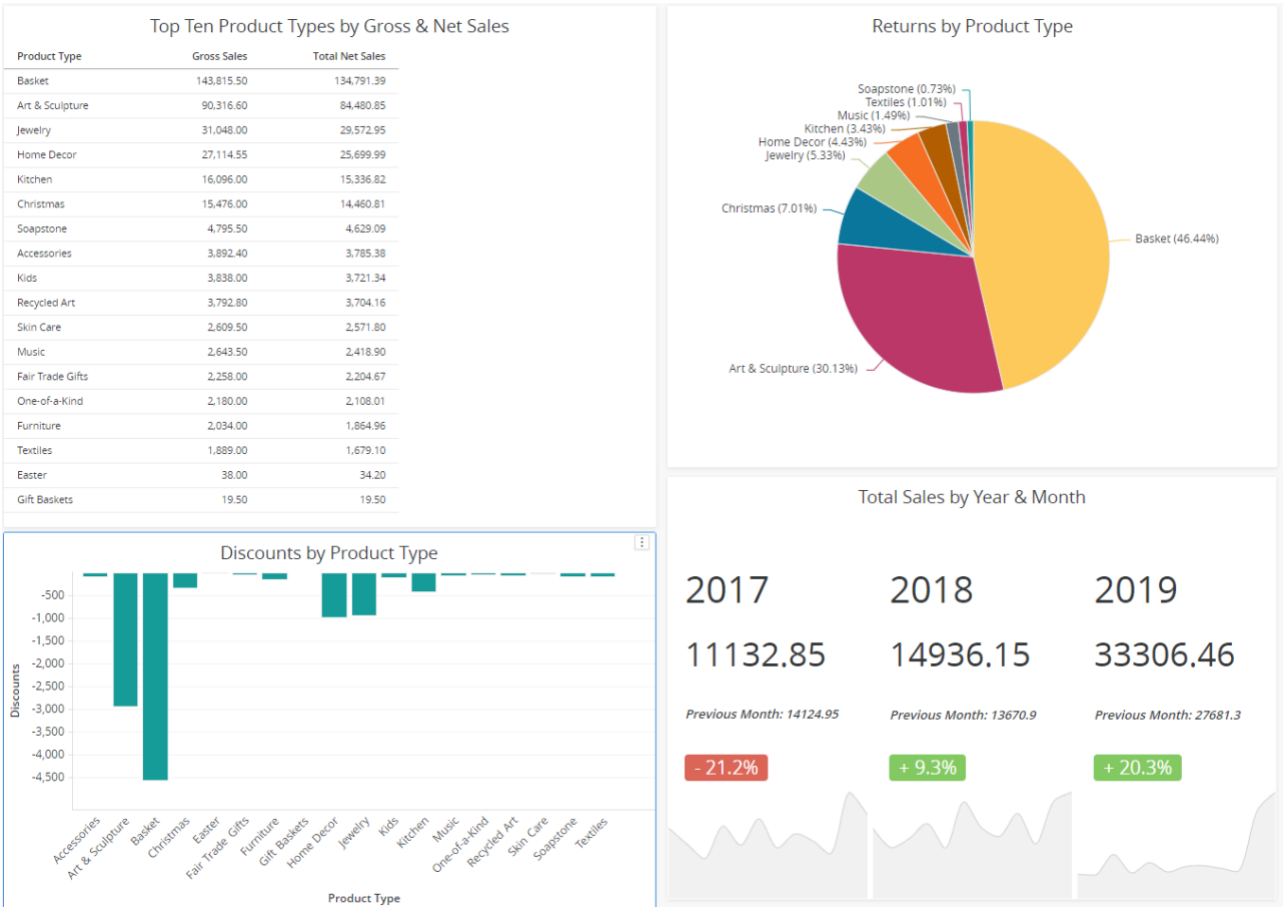


Figure 5. A more comprehensive dashboard breaking down sales by item categories.

This dashboard covered sales data of this small retail business more categorically. Here, the top five products from this small retail store in terms of gross sales and net sales from 2017 to 2019 were baskets, arts & sculptures, jewelry, home décor, and kitchen items. Baskets were the most popular item in the three-year timespan such that many of the sales transactions for this retail store heavily are emphasized on baskets and arts and sculptures.

Figure 6. Retail Store A: Sales and Costs by Year, 2017–2019

This dashboard shows the values of Retail Store A's sales and costs by year. The sales by year chart shows all shipping, gross, and net sales, which the sum of these three kinds of sales consist of the total sales for Store A. Each year after 2017, Store A experienced a rise in sales but also saw a rise in discounts and returns, which were the only two known losses provided in Store A's dataset. It is expected that the more sales there are in the year, the more returns and discounts there likely would be because of an increase in transactions and an increased curve in these customers who choose to return any items or even get lower prices on products they buy.

Discoveries from Accompanying Retail Datasets

This section will use datasets containing information on other retail stores from different periods of sales opportunities and cost analysis. Based on the information provided and for privacy purposes, the comparing datasets for this retail store will be defined as Retail Store B, which did not specify from which physical location(s) the store is, nor did it release its name for privacy reasons, but did provide this data batch of sales, orders, and product inventory. The situations of these retail stores are different from the current unnamed business that is being used for this analysis and comparison to the small retail business dataset also came from Kaggle (World Opendata, 2021). This is a more robust and comprehensive dataset which contained sales information from January 2020 to June 2021 and has more details about the kinds of products bought, the customers that bought from this other unnamed retail store, and any applicable connections between the consumers and the employees that may have helped them out. There was more information provided in this dataset about the customers purchasing from this retail store, as well as the employees who assisted those customers.

This eighteen-month period which data was collected did in fact occur during the COVID pandemic, but analysis was done to evaluate unpredictable moments of financial opportunities despite any restrictions, limitations, or the overall downward trend of customers physically visiting retail stores. Due to rising cases, lockdowns, and colder seasonal weather in the Fall and Winter months, sales also dropped in this retail store, Store B, because of customers' concerns towards contracting COVID in public gatherings. From some of the findings, Store B had more documented flexibility with the orders and sales that were processed. When cases rose in the United States from October 2020 to January 2021, overall sales gradually dropped from the peak of nearly $15 million that was achieved in pre-COVID January 2020. The data from Store B was informative because of how helpful some of these findings could be for Retail Store A to consider measuring as part of their recovery plan during the pandemic.

The focus of how business intelligence will be used around data will continue around retail sales data over time. It was useful of this other retail dataset to provide its own forecast sales as part of this analysis. For analysis of this dataset representing Retail Store B, Microsoft Power BI was used because of its functionalities that were better suited for data with more

column characteristics. It proved to be more versatile to the complexities of a larger dataset. Even though some cleanup and formatting were required to best understand Retail Store B's data, there was much more information that Store A lacked, and that it can find useful to show data that better shows how the store's employees communicate with their customers.

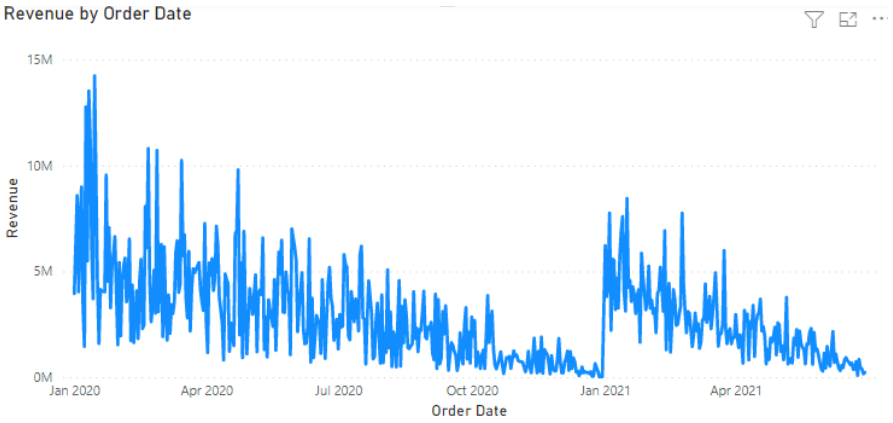
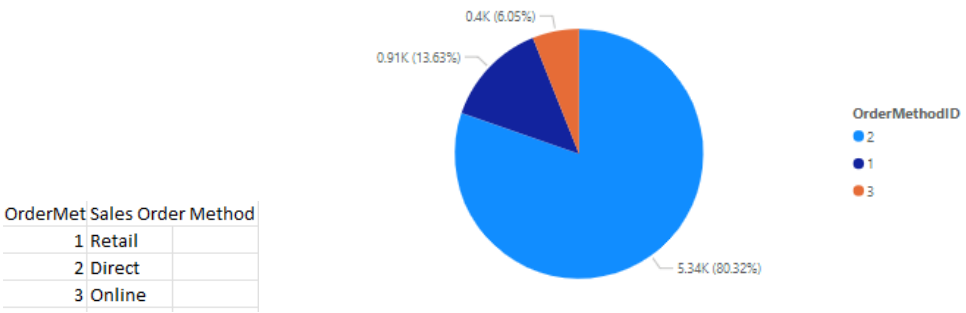


Figure 7. Revenue by order date, January 2020 to June 2021.

Retail Store B contained data from this unnamed business in this eighteen-month period, where this company also was heavily affected by the pandemic and expected declining sales. It can be seen from this visualization of revenue by order date, that on any given day, how customers react to any COVID-related restrictions or better offers for products elsewhere that there existed inconsistency. There were some days during this period where Store B's revenue reached highs, but other days where there were less sales or transactions and did not result in high overall sales.



OrderMet	Sales Order Method
1	Retail
2	Direct
3	Online

Figure 8. Quantity of orders by order method type.

Figure 8 showed a more detailed analysis of the kinds of orders that Retail Store B had its sales from in this period. There are three separate categories of sales in Store B that process and deliver these orders to the customers. They are: 1) Retail, which are in-person or brick-and-mortar purchases of items; 2) Direct, where customers are veered towards the products that they might want to buy; and 3) Online, where customers place orders for products that they want to buy through their website and have it delivered to them after a given amount of time, which is another form of a retail purchase. All three methods are forms of retail methods, but retail involves more in-person interaction between customers and employees, while direct sales use different forms of marketing to lure regular and even new customers towards their products (Smyth, 2021). This can be in the form of memberships for good deals on products, periodical newsletters via email, flyers in the mail, or other forms of customers investing with the same company. In the visualization, 80 percent of orders were direct sales, followed by retail (13%) and direct sales (7%).

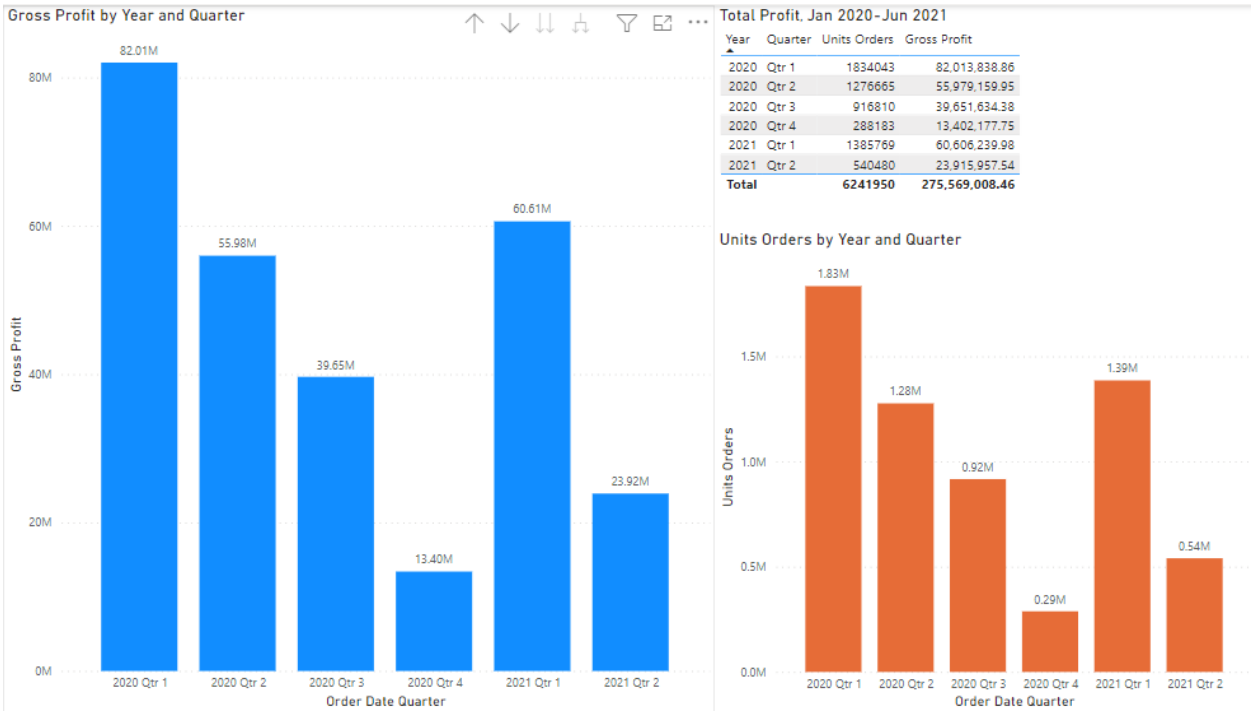


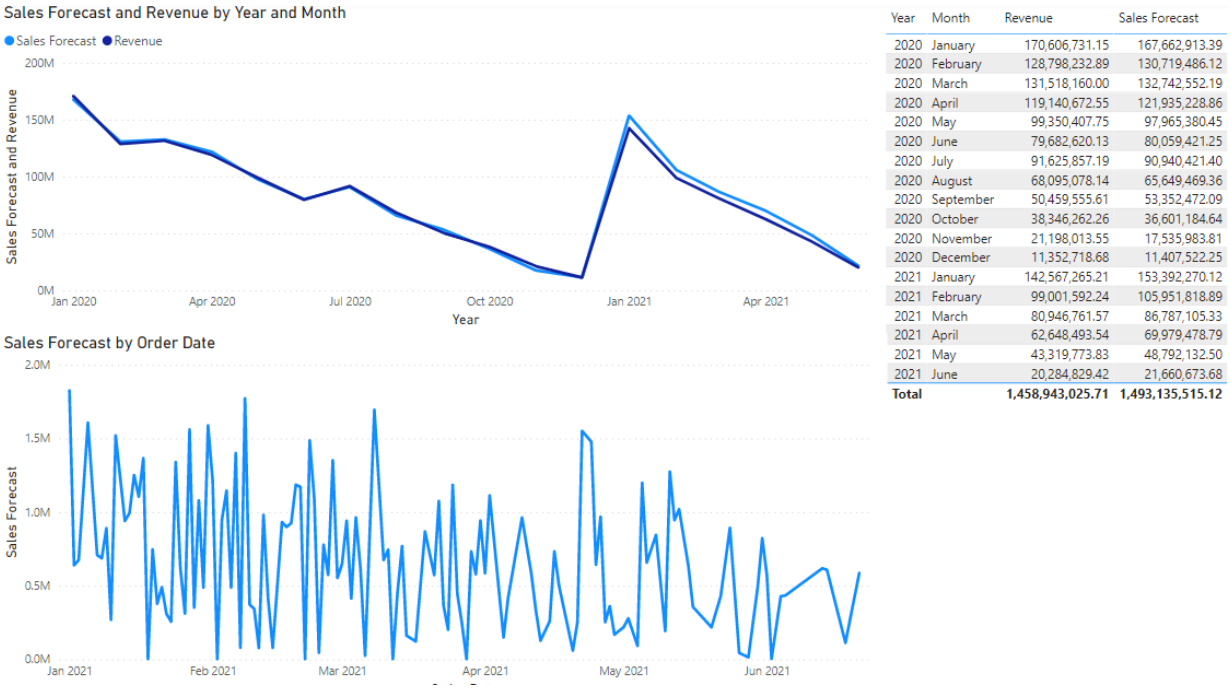
Figure 9. Analysis of gross profit of orders by year and quarter, January 2020–June 2021.

In the eighteen-month period from January 2020 to June 2021, Retail Store B experienced a total profit of $275.5 million. The dashboard shows how many orders were

processed by this store and the profit it made, where profit is this money gained after any costs, payments, or losses. On average, the store has around 1 million orders that are processed per quarter. The quarter with the most gross profit was Quarter 1 of year 2020, which was prior to the pandemic, where Store B made more than $82 million in total profits.

Comparing the Analyses

Under the conditions that the Retail Store A endured and has continued to go through, the information from Retail Store B was necessary to plan how it can move forward from the major losses it had during the pandemic. The predictive analytics that come with this would provide helpful guidelines to the small retail business for recovering from the crisis after losing a large majority of their workforce. Store B's categories and components provided details as to what kind of data that Store A should collect and why.



Year	Month	Revenue	Sales Forecast
2020	January	170,606,731.15	167,662,913.39
2020	February	128,798,232.89	130,719,486.12
2020	March	131,518,160.00	132,742,552.19
2020	April	119,140,672.55	121,935,228.86
2020	May	99,350,407.75	97,965,380.45
2020	June	79,682,620.13	80,059,421.25
2020	July	91,625,857.19	90,940,421.40
2020	August	68,095,078.14	65,649,469.36
2020	September	50,459,555.61	53,352,472.09
2020	October	38,346,262.26	36,601,184.64
2020	November	21,198,013.55	17,535,983.81
2020	December	11,352,718.68	11,407,522.25
2021	January	142,567,265.21	153,392,270.12
2021	February	99,001,592.24	105,951,818.89
2021	March	80,946,761.57	86,787,105.33
2021	April	62,648,493.54	69,979,478.79
2021	May	43,319,773.83	48,792,132.50
2021	June	20,284,829.42	21,660,673.68
Total		**1,458,943,025.71**	**1,493,135,515.12**

Figure 10. Sales forecast and revenue by year, month, and day.

Despite the small store's increased emphasis on online sales, because the internet is a large place with various websites accessed from anywhere around the world, how this retail store will

better sell itself is another major prediction that is necessary moving forward. The physical location of the store(s) would also be required to attract more attention locally and to maintain or build new relationships with different kinds of customers. Reaching out to customers online by providing them a bi-monthly or weekly newsletter with some of the best values are, though costly and often done by bigger retail stores, would aide dropping the prices of some of their items but also attract new customers through connections and even by word of mouth.

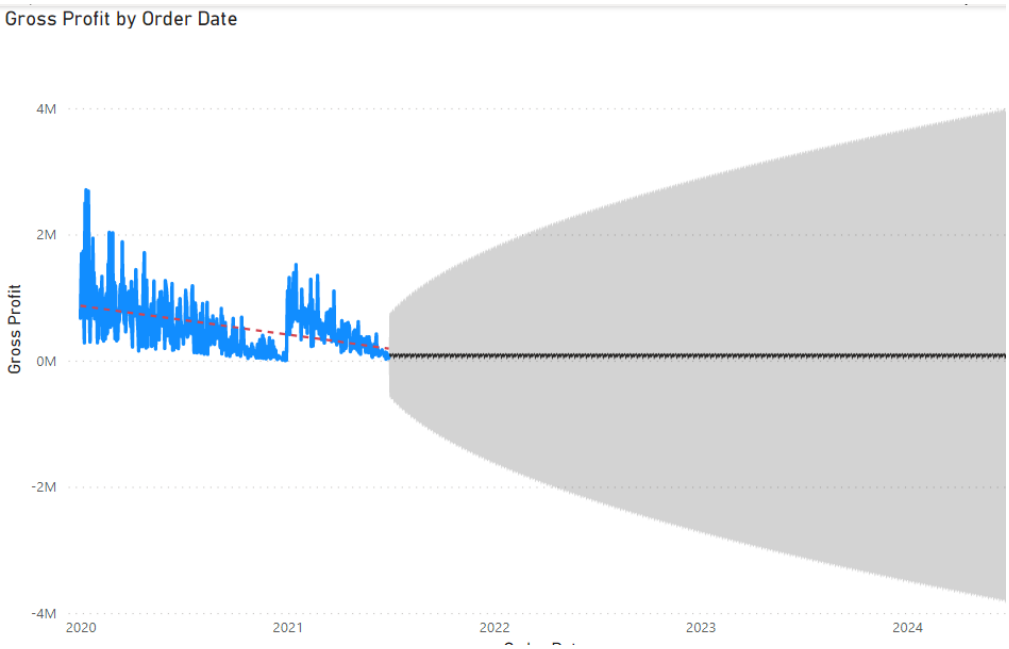


Figure 11. Retail Store B's gross profit forecast through June 2024.

Retail Store B provided a forecast analysis of their sales that Retail Store A could possibly find helpful for additional insights using business intelligence. This store had a more robust system for tracking revenue and inventory, and experienced variable changes of how sales fared in this eighteen-month period on a day-to-day basis. Store A lacked a system to evaluate its overall performance with and around customers outside of their purchases, returns, or any other transactions to determine how often they bought from this store. The above visualization shows Store B's potential gross profit through June 2024 using Microsoft Power BI's forecasting tool. Despite the inconsistencies of gross profit from January 2020 to June 2021, analysis can be done on the wide range that Store B's profit can be from now through June 2024. Store B's maximum

profit potential could possibly grow to $4 million based on the volatile performance in the eighteen months of data which have been provided for this analysis.

Solutions and Final Suggestions

The small retail store, where sales had been primarily online with twenty-five employees, suffered losses by making a tough decision to cut their workforce by eighty percent due to the pandemic and only have five remaining. While 2019 was their most successful year per the data, it was expected that the company suffered losses due to a minimizing of in-store sales. This section will cover what this retail store should do to avoid maximal losses the next time, but more importantly, how the company should act now to at least recover some of the losses because of the pandemic.

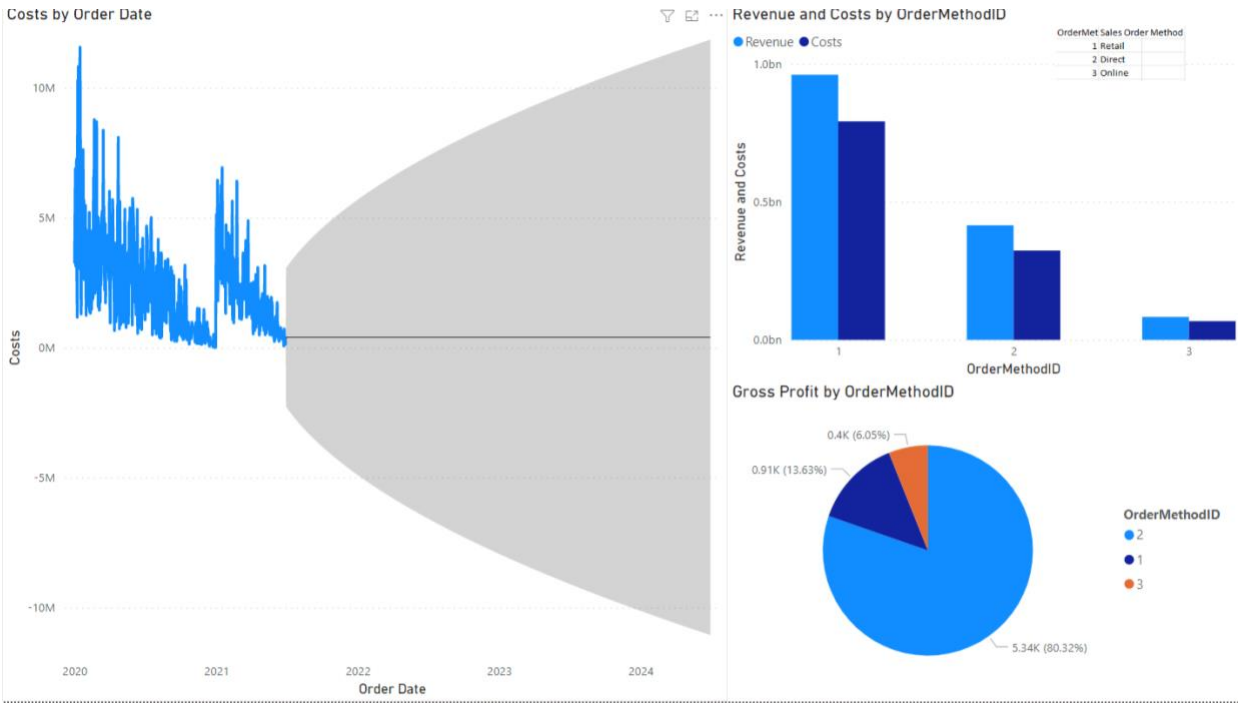


Figure 12. Retail Store B's costs by order data forecast model, analysis on potential materials used for packaging or location(s) of products and orders for customers doing direct sales or online sales.

The first suggestion for this Retail Store A is to find more ways to get data from both new and current customers. The two datasets provided by this small online retail store, despite having collected sales, costs, and other measurements of finances over three full calendar years, did not do an effective job at better understanding what customers' needs were despite knowing that baskets, sculptures, and other products arts and crafts were three of the categories that were generating the most revenue for the store. Better understanding of customers' buying habits and how much or how long they have spent their money in this store would be necessary for future retention opportunities, and new ways to gain new customers. Store A should take an approach such as Figure 13, which will do some forecasting of costs or additional payments that take away from profits or the desired budget.

Next, because in these three years the Store A placed a higher emphasis on the online sales, costs, and returns, the store should have a more robust documentation system of recording customer transactions and orders. It was a bit complicated to do more detailed analysis with the BI tools in place because the data provided were only in terms of categories, years, and any net totals of financial values or quantities. Not understanding what customers dealt why lots of money was lost in returns and discounts would have been a deeper analysis on key performance indicators for costs. Returns and refunds simply did not happen at random but getting a basis on the top three or five reasons why customers returned their products can bring up questions about the quality of their products currently in inventory, where only item categories' sales, costs, and returns were featured in their datasets.

Because there were returns that were recorded in the acquired data, there must be a focus on the physical location(s) for any customers that need to return their previously purchased items to the store. There will still be consumers that would prefer to see the products up close like tables or paintings, to test appliances out on their own, or even try on an article of clothing. While more retail businesses are gearing towards online orders, supply and demand still relies heavily on a store's physical location to log products from various vendors, then deploy the items to the customers who had online orders.

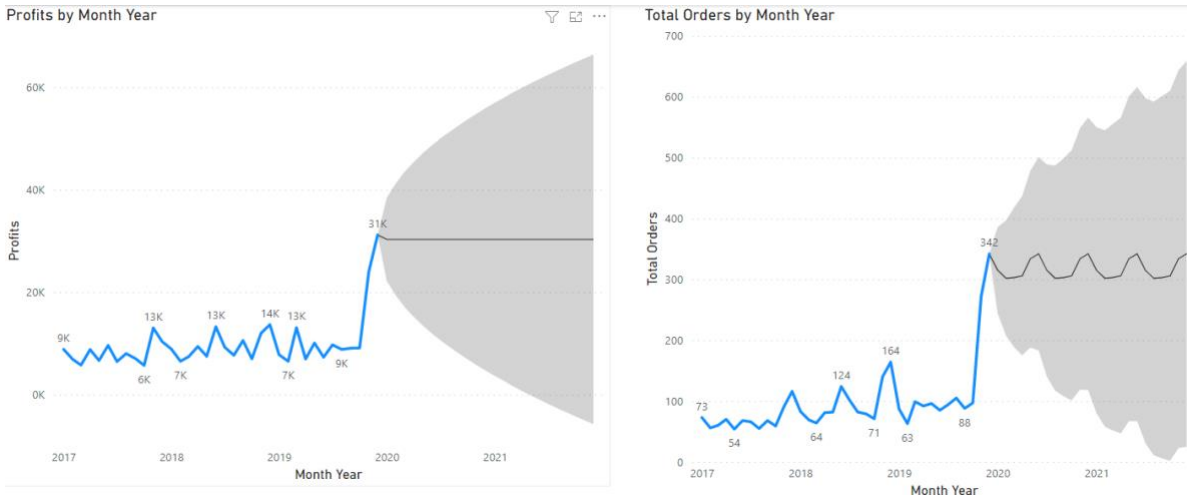


Figure 13. An excerpt of a dashboard using Retail Store A's data to help forecast profit count and order count in future years.

Working with different forms of raw data required a period of understanding what information about a retail store was missing, as well as what one dataset may have that another dataset from another retail store might not have. Not one dataset is ever simple to use any kind of business intelligence tool to understand descriptive statistics or evaluate performance of a business or do a case study for scientific research. Retail Store A, despite efforts to boost their online sales, needed to widen customers' opportunities to take orders and transactions. While they did have other revenue streams such as in-person retail, how they retail their customers through online communication was not provided but could have been helpful for analysis on supporting their purchasing needs. Their future dataset can contain more dimensions or variables to gain customer feedback but also determine how many new customers were gained in a year, and how many regular customers still paid for their products the year after.

This analysis showed how challenging it can be for small businesses who may be dealing with financial situations where there are more losses than gains. Especially for the retail industry, regardless of whether most of a store's sales are online or through brick and mortar, layoffs and cutting opportunities for customers to physically possess items they like take a toll on what services will best suit their needs. Despite having only five employees working for the small retail business during the pandemic, there are still many kinds of growth opportunities to strategically convince customers through both in-person and online retail to support them and invest in their products. A robust system of preparedness and strategizing how the company

supports its customers will always be a primary focus in the retail industry and should be adopted not only for Retail Store A, but for any kind of customer-centric service. Finding out what is best or what needs to be improved for customers are needed for the future are necessary for future retention and better planning and preparing for any kind of crisis that might break relationships between employees and customers, be it online or in retail stores.

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