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Problem Statement

It wishes to analyse the behaviour of the profits generated by the sale of products of the e-commerce company Amazon during the period 2011 to 2014 in 11 states in the western United States, based on data obtained from the Kaggle website, with records of each sales order issued, showing order date, shipment date, email_id, geography, category, product name, sales, quantity and profit. The analysis will determine the business's overall performance, i.e., whether during the period 2011 to 2014, the business closed with more profit than loss or if the opposite was true. It will also seek to know how much the losses were, their proportion to profits and which product generated more losses.

First, the initial data in xls format will be cleaned, and value information will be extracted and arranged in additional columns to achieve this purpose. After assembling the final data, made up of the initial clean data and the additional columns, it will be exported to the business intelligence tool Power BI and one or more dashboards will be created to facilitate the analysis of the information and, finally, to be able to extract practical and valuable conclusions and recommendations that can be applied to improve the performance of the business, making it more efficient.

Any analysis, conclusion, or recommendation given in this report will be made by trying to simulate a real case at present from data that is more than ten years old, only for practice and training purposes.

Theoretical Framework

Before carrying out the analysis, some fundamental definitions must be taken into account in order to have a better understanding of what is going to be analysed:

Sales: Represents the price of a product multiplied by the number of items sold of that product.

$$Sales = Price * Number\ of\ items\ of\ the\ same\ product \tag{1}$$

Costs: Represents the amount of money spent by the company to purchase or produce a product in order to sell it and make a profit.

Profit: The profit obtained as a result of the difference between the sales and the costs of each product.

$$Profit = Sales - Costs \tag{2}$$

According to equation 1, if the product's sales are greater than its costs, the product will generate profits. Conversely, if the product's sales are less than its costs, the product will generate losses.

Gross profit: It is the profit obtained from one or several products, without taking into account their losses.

Net profit: It is the profit obtained from one or several products, taking into account their losses.

$$Net\ profit = Gross\ Profit - Loss \tag{3}$$

Positive net profit: This is when gross profit is greater than losses.

Negative net profit: This is when gross profit is less than losses.

Note: It is important not to confuse negative net profit with losses, as a product can generate losses and maintain a positive net profit.

Percentage of profit: Indicates the percentage ratio of profit, whatever it is, to gross profit.

$$Profit\ (\%) = \left(\frac{Profit}{Gross\ profit}\right) * 100 \tag{4}$$

Percentage of losses: Indicates the percentage ratio of losses to gross profit.

$$Losses\ (\%) = \left(\frac{Losses}{Gross\ profit}\right) * 100 \qquad\qquad \textbf{(5)}$$

What is Amazon's retail business model based on?

Amazon's retail business is based on the Internet and e-commerce, totally focused on the customer with its own logistics system, and in which any person or company, however small or large, can sell their products through a 100% optimized and easy-to-use platform where they can manage everything related to their account, brand, and product. Amazon seeks to meet high demand and provide each consumer with the product they want, however small.

Results and Performance Analysis

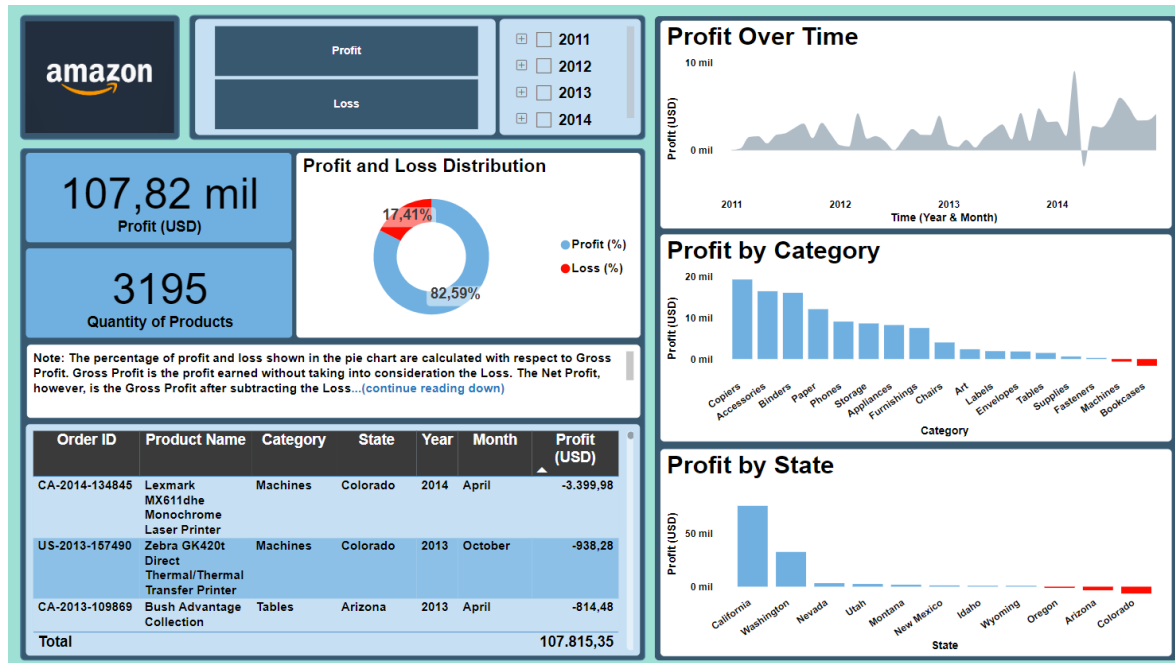**<u>Analysis of overall business performance, period 2011 - 2014</u>**

Figure 1. Dashboard 1 (Overall business performance, period 2011 - 2014).

Figure 1 shows the performance of the business during the period 2011 - 2014. It is evident that, at the end of this period, the business closed with a positive net profit of USD 107,815.35, generated by 3195 products sold. The ratio to gross profit is 82.59% positive net profit and 17.41% loss, as shown in the circular doughnut diagram. From the analysis of the three graphs on the right-hand side of the dashboard, the following can be observed:

Gain over time graph: The lowest peak of negative net gain corresponds to April 2014.

Graph of gain by category: The two product categories generating negative net gain, from highest to lowest, are Bookcases and Machines.

Profit chart by state: The three states generating negative net profit, from highest to lowest, are Colorado, Arizona, and Oregon.

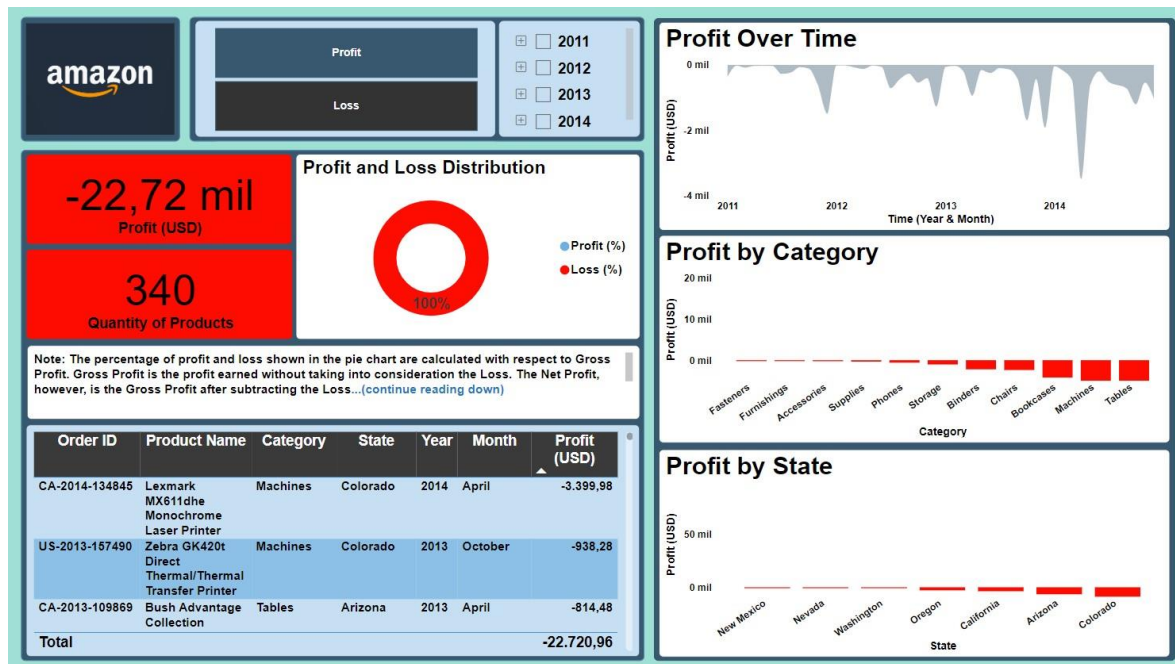## Analysis of business losses, period 2011 - 2014.

Figure 2. Dashboard 1 (Losses).

340 products generated 100% of the losses, equivalent to 22,720.96 USD, during 2011 - 2014, as shown in Figure 2. From the analysis of the three graphs located to the right of the dashboard, it is evident that:

Profit over time graph: The lowest peak of losses is in April 2014.

Graph of profit by category: The product categories, in order of those generating the most to the most minor losses, are Tables, Machines, Bookcases, Chairs, Binders, Storage, Phones, Supplies, Accessories, Furnishings, and Fasteners.

Profit chart by state: The states, in order of most to least loss-making, are Colorado, Arizona, California, Oregon, Washington, Nevada, and New Mexico.
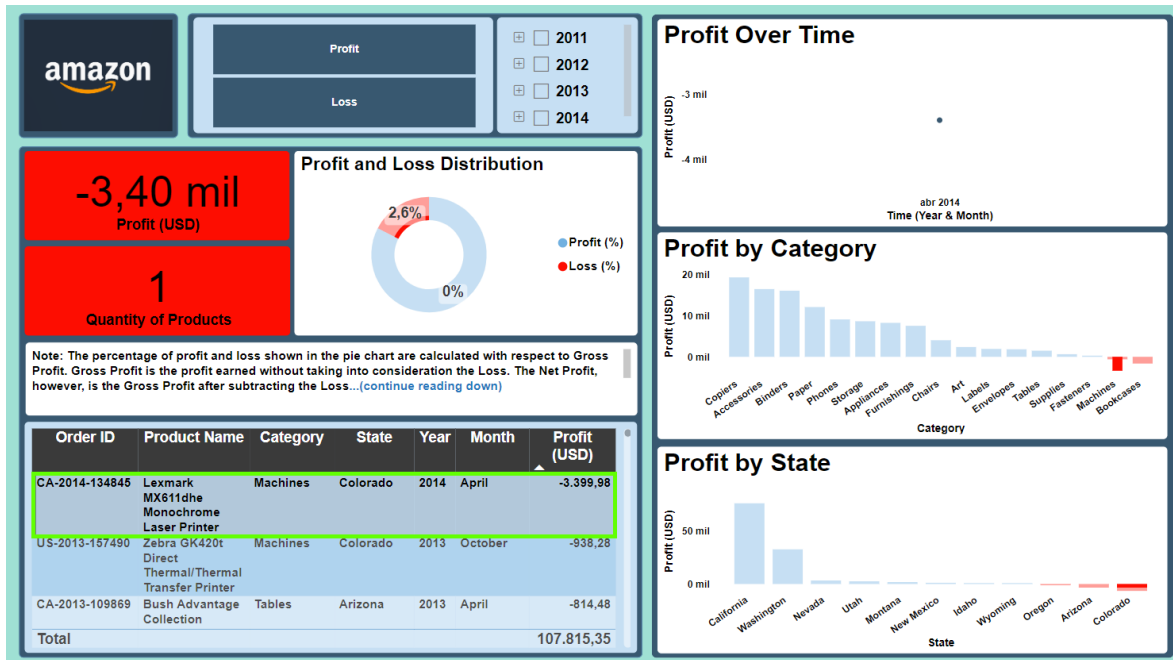
Which product generated the most losses?

Figure 3. Dashboard 1 (Product that generated the most losses).

Marked inside the green box, as shown in Figure 3, the product that generated the most losses is located under the order CA-2014-134845, and it is the Lexmark MX611dhe Monochrome multifunction laser printer, belonging to the Machine category, and whose sale was made in April 2014, coinciding with the peak of negative net profit of the business performance analysis, and with the lowest peak of losses of the business loss analysis. The loss was USD 3399.98, equivalent to 2.6% of gross profit.
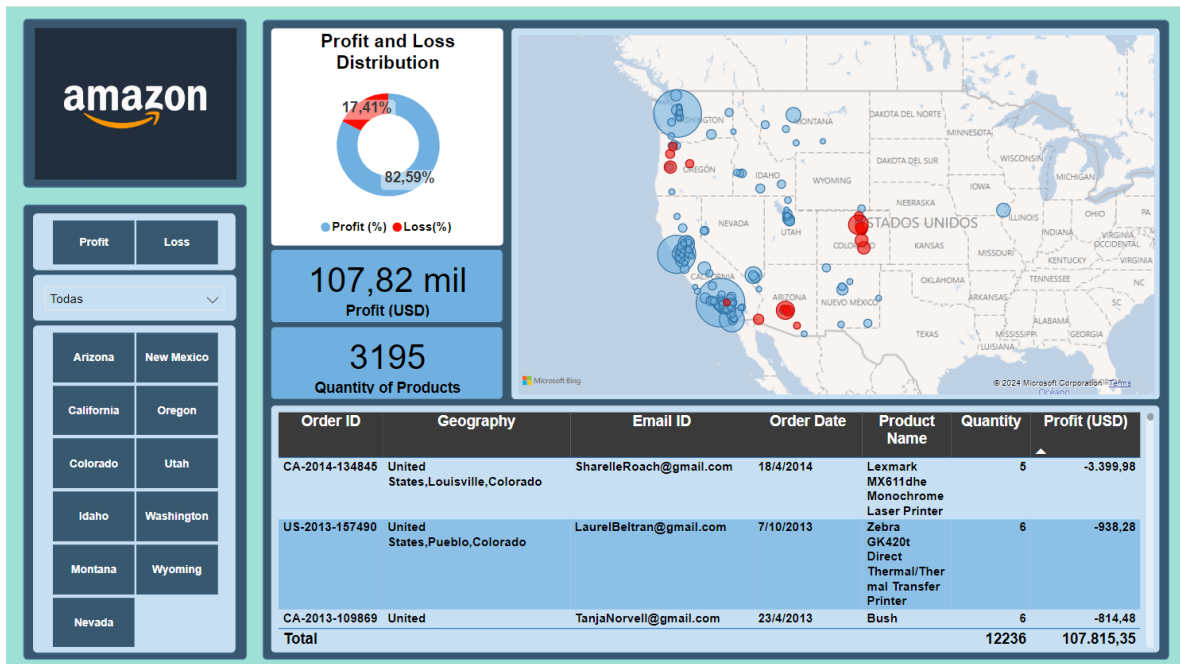
Figure 4. Dashboard 2 (Location of the order).

To obtain more specific information on the order CA-2014-134845, Dashboard 2 in Figure 4 is used, which contains a map with several circles in blue and red, distributed according to the location. Blue indicates positive net gain and red indicates negative net gain. The diameter of each circle indicates the magnitude of the net gain. Subsequently, with the order and status data, the search is performed.
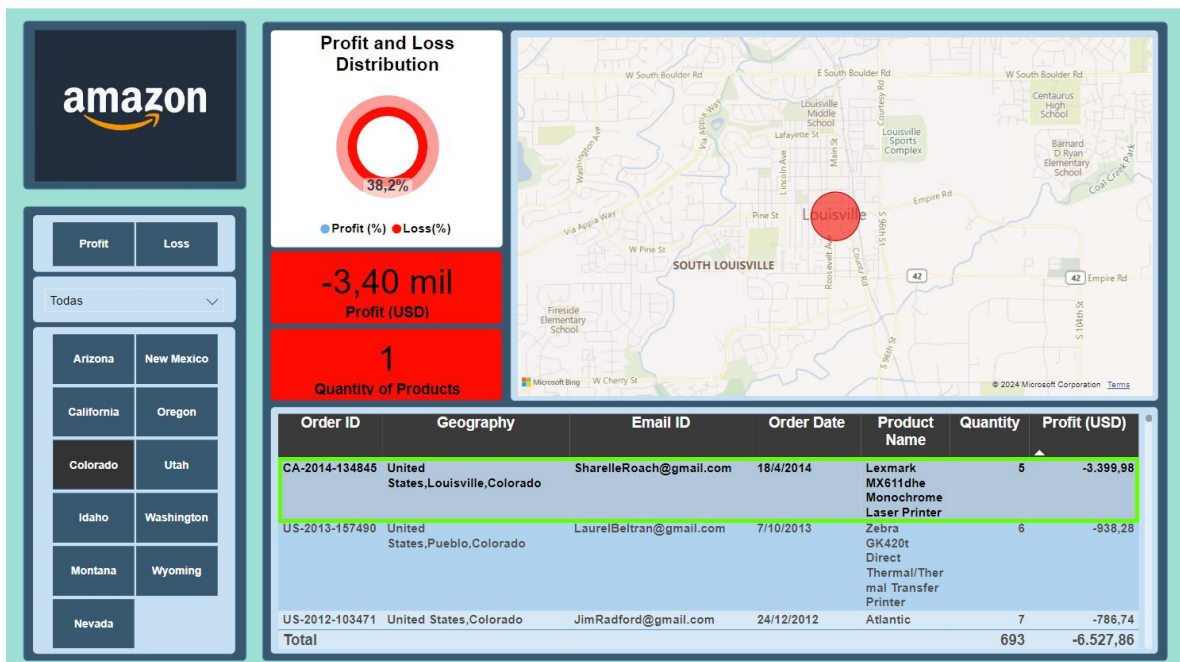

Figure 5. Dashboard 2 (Order CA-2014-134845, Colorado).

The green box in Figure 5 shows that order CA-2014-134845 comes from Louisville-Colorado and was placed by SharelleRoach@gmail.com on 18 April 2014. The order consists of an order for 5 Lexmark MX611dhe Monochrome multifunction laser printers.
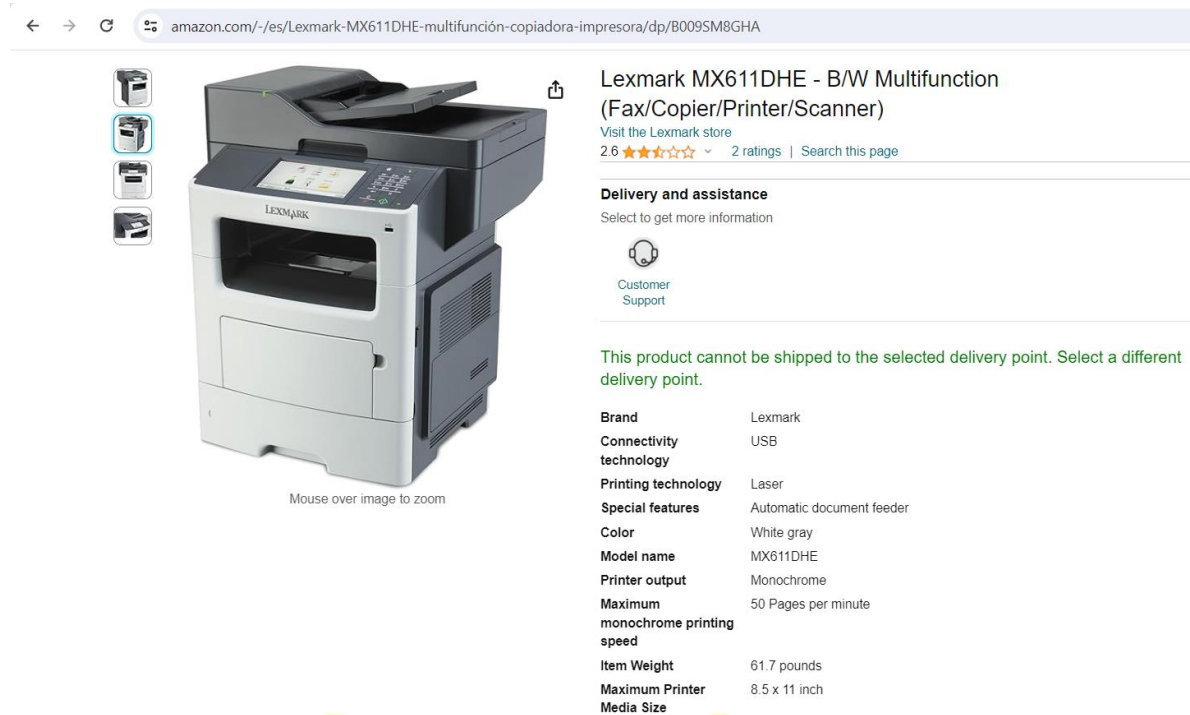

Figure 6. Lexmark MX611dhe Monochrome multifunction laser printer.

| Product dimensions	22.6 x 23.5 x 26.5 inches
ASIN	B009SM8GHA
Product model number	35S6702
Average customer opinion	2.6 ★★☆☆☆ ⌄ 2 ratings 2.6 out of 5 stars
Ranking in Amazon's best sellers	#693,481 in Office Products (See the Top 100 in Office Products) #1,986 in Computer Laser Printers
Discontinued by manufacturer	No
Product on amazon.com from	October 20, 2012
Maker	Lexmark
Language	English

Figure 7. Product information.
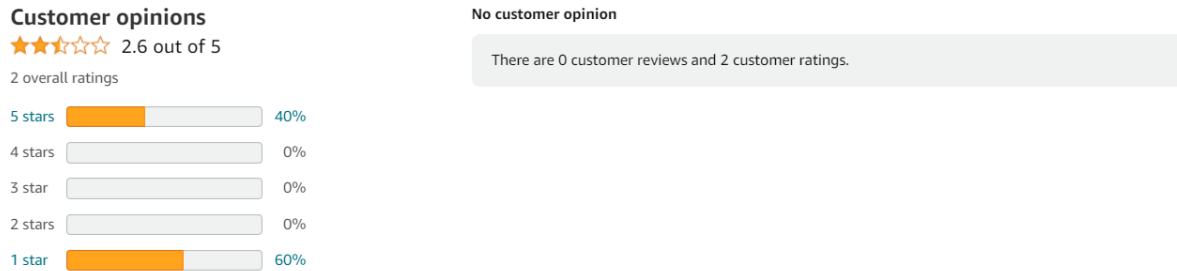
Figure 8. Customer opinions and product classification.

A more detailed product analysis, as shown in Figures 6, 7, and 8, reveals several observations as of 26 March 2024.

- Lexmark manufactured and marketed the product.

- The product is currently unavailable for sale, and it is yet to be known whether it will be available in the future.

- The product has been available on Amazon.com since 20 October 2012.

- The manufacturer has not discontinued the product.

- The product is rated 693481 in office products and 1986 in computer laser printers.

- The product has a customer rating of 2.6 out of 5.

- The product has two ratings and 0 reviews.

From the information extracted from the product, it can be deduced that it was not a sales success in the market, that it is far from even entering the top 1900 best-selling printer models and is above the 690000 best-selling office products. Having only one single sale of 5 units in the period 2011 - 2014, it is notable that that sale was made well below cost, resulting in a loss to Lexmark of USD 3399.98, a loss equivalent to 2.6% of Amazon's reported gross profit for that period on that sale alone. To date, the product has not been discontinued by the company, which means that, although it is no longer produced, it still has units in stock, and over the years, it is expected that the company will gradually sell the remaining units of the product until it can reduce its inventory as much as possible and recover a fraction of the investment costs.

CONCLUSIONS

1. Amazon closed in positive during the period 2011 - 2014. With a positive net profit of 82.59 % compared to gross profit.

2. Amazon's loss from 2011 - 2014 was 17.41% relative to gross profit.

3. The number of loss-making products was 340.

4. The most loss-making product was the Lexmark MX611dhe Monochrome multifunction laser printer, with 2.6% of gross profit.

RECOMMENDATIONS

Withdraw the 340 loss-making products and replace them with new products equivalent in category and function that can supply the demand and become profitable.

References

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