MBUA 512 Report

Ecommerce Operations Strategy Report

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# Executive summary

Kiwi E-commerce is a fast and up and coming e-commerce company that produces local New Zealand products of the highest quality. After starting in Tauranga, the business has expanded across New Zealand. Its witty advertising campaigns, clever product promotions and coupon campaigns have allowed the company to grow rapidly over the last 2 years.

Covid 19 has had a tremendous impact on their business growth, and it has also put the company position ahead over 1 year ahead of its long term business growth. This is, in addition, to still maintaining a relatively lean headcount and the leadership team is still heavily involved in the daily operations such as customer support, shipping, and logistics along with their senior management responsibilities.

The next stage of growth is aimed further to increase its growth and expansion to overseas markets. It would first like to target Australia and expand further into the Asia Pacific market within the next fiscal year.

## History behind project

A recent voice of the customer rumor suggests that customers are not 100% satisfied with their local service and capabilities. The report and investigation began after several comments that occurred on a recent social media post where customers were complaining about multiple shipment delays and, more so, poor customer service, including having to make numerous phone calls to find out where their order was due to an inability to track parcels outside of the phone hotline.

Furthermore, customers who had experienced this have started to take their business else ware suggesting that customer loyalty is beginning to fade too. A recent new article online stated that customers were frustrated with their delivery delays, with some offering up to 50% of all parcels were delayed. In addition, the company recently implemented a percentage-based money-back guarantee on top of existing orders for products that are delayed on shipment.

The senior leadership of Kiwi E-commerce have acknowledged that the focus on rapid growth and sales may not be met with appropriate actions to improve internal shipping and customer experience.

The initial hypothesis is that Covid 19 had sudden increased the growth rapidly in sales; however, due to a lack of further development of the company’s internal infrastructure, warehouse and shipping facilities, capabilities may need to be upgraded to keep pace with the current business stage and growth.

Thus, management has shifted their priority from overseas expansion to focus on improving and optimising the local New Zealand market procedures, ensuring that their operations are up to satisfaction, and ensuring that future growth demands will be met.

This report, therefore, looks to delve into some of the main reasons behind this and where the company can improve its local operations before shifting its overseas expansion.

# Methodology

The company has engaged in an internal investigation to determine what is happening to orders shipments and what could be some of the underlying factors that are causing these delays to occur.

As the company is focusing on solving its shipping inefficiency, we will be using a quantitative analysis to delve into and explore the critical metrics of data provided. We aim to see what is potentially causing the delays in shipping experiences related to the shipping method, weight, cost, and potential impact on the companies discount policy.

We are looking to find any high-level insights to be shared with the senior leadership team to allocate resources, upgrade systems and or make the necessary investment to improve the business operations.

Finally, recommendations will be given at the end of the analysis based on the findings along with limitations by

## Data set

The dataset used for model building contained 10999 observations of 12 variables.  
The data contains the following information:

* ID: ID Number of Customers.
* Warehouse block: The Company has a big Warehouse which is divided into block such as A, B, C, D, E. Each order is shipped from one of these warehouse blocks.
* Mode of shipment: The Company ships the products in multiple ways such as Ship, Flight and Road.
* Customer care calls The number of calls made to enquiry about the shipment.
* Customer rating: The company has rated from every customer. 1 is the lowest (Worst), 5 is the highest (Best).
* Cost of the product: Cost of the Product in NZ Dollars.
* Prior purchases: The Number of Prior Purchase made from the customer
* Product importance: The company has an additional paid service for priority shipping.
  + High- Same day
  + Medium- Overnight service
  + Low- Standard postage 1-3 days.
* Gender: Male and Female.
* Discount offered: Discount offered on specific product order.
  + Generally, most products are offered a small discount of up to 5% due to popular E-commerce coupon campaigns
  + Discounts are further offered if the product is delayed beyond the expected delivery date.
  + Some products are excluded from additional discounts even if a product shipping arrives late.
* Weight in gms: The weight in grams of the order.
* Reached on time: whether the item arrived on time to the customer or not. 1 Indicates that the product has not arrived on time, and 0 indicates it has arrived on time.

## Key questions and research goals

Therefore, the company leadership team has raised funding to be and want to improve the 3 significant areas of the business operations.

**Where are the current insights of the in the contemporary logistics and shipping procedure?**

* What warehouse block is being used the most?
* What are the main shipment methods?
* Shipping priority of orders.
* Prior purchase history

The above findings are aimed at gaining a high-level overview of the current order history and shipping status

**How can they improve the delivery experience and increase efficiency?**

We will be comparing the difference between orders that arrived on time vs those that they are delayed to find any key differences and discrepencies.

**Business and process optimisation**

We will they do a deeper look and break down into some of the trends that are causing shipments to be delayed and focus on getting to the root causes within the data provided.

**Why do we believe this analyst strategy will work?**

As Kiwi E-commerce has not begun tracking or measuring their E-commerce delivery operations, the organisation firstly has a limited understanding and no baseline results; thus, the company needs to understand the basics before moving forward with plans to optimise certain business areas.

Secondly, a clear understanding needs to be made of what is causing the delays and late order shipment; special consideration will be taken into finding the causes behind this. Finally, the analysis strategy will allow the company to gain a high-level understanding of the business issues causing a delay in shipment and gain a deeper understanding of specific business functions through further analysis reports and or, where possible immediate action to remediate the situation.

**Benefits and objectives**

1. Kiwi E-commerce can develop and set a plan for future business optimisation by understanding baseline company metrics.
2. Kiwi E-commerce can understand the critical differences between orders that arrive on time vs those that are late
3. Kiwi E-commerce can understand and begin to plan how to tackle the business issues to improve their performance and goals.

# Data transformation

As the data has been prepared in relatively good condition by Kiwi E-commerce, we have taken the following steps to ensure the data is cleaned and in quality

Firstly, we checked through the data set is complete using the sum(is.na(customer\_data)) function; this returned the result of 0 values with N/A. Secondly, we confirmed the data characters were workable using the summary(customer\_data)

We used the recode faction function to 1 column Reached.on.Time\_Y.N and changed the following for ease of understanding.

**Reached.on.Time\_Y.N**

|  |  |  |
| --- | --- | --- |
| Original value | Meaning | New Value |
| 0 | Order was delivered on time | On-time |
| 1 | Order was late | Late |

Finally, we will be transforming the data into 5 different tables for analysis.

**By shipping methods**

Ship

Plane

Land

*By Delivery status*

On-time

Late

# Analysis and trends

## Basic Biodata Analyis

First, we will look at the key metrics across the dataset.

Chart, bar chart

Description automatically generated

The current gender mix sees an equal balance of both male and female customers.

Chart, bar chart, histogram

Description automatically generated

During Covid 19, the E warehouse block was closed; thus, this is reflected with the F block, almost double the amount in orders processed. Furthermore, other warehouse facilities seem to be doing on average around the same, suggesting that each warehouse block is used equally.

Chart, bar chart

Description automatically generated

The company is still heavily reliant on shipping methods which is almost 4 times the amount of flight or road delivery options.

Chart, histogram

Description automatically generated

There is a definite skew of orders from customers towards the lower end of orders with a sharp drop off after 4 orders. This may suggest an issue with customer loyalty as there seem to be fewer customers who become long-term repeat customers. In addition, the shipping issues may have impacted their purchasing decisions after the 3rd order, too, due to negative experiences of their products arriving late.

Chart, bar chart

Description automatically generated

The majority of products are currently shipped either low or medium priority. Less than 10% of all customers have used the higher

Chart, bar chart

Description automatically generated

Customers are equally ranked across all categories, with an even spread of customers between the 5 tier ranking system.

## Analysis between shipping services, late and on time deliveries.

As the issue revolves around the shipping times being either late or on time. The next part of our analyst will look at the differences between orders that arrived on time to those that did not.

Chart, bar chart

Description automatically generated

Our analysis suggests that just under 60% of all orders have been recorded as a late delivery. This is in comparison to around 41% that have arrived on time. Thus, the analysis suggests that the customer's recent voice and Facebook reports have a substantial degree of validity to their cause.

Chart, bar chart

Description automatically generated

Shipping methods data suggest that all 3 methods suffer from a similar trend where around 60% of each order is late and not on time.

Chart, bar chart

Description automatically generated

Interestingly the customer rating has had no significant impact on the delivery status, with a consistent trend of around 60% of customers experiencing a delay in their order.

This is interesting as the customers with a higher rank are valued with a higher priority level by the company.

Chart, bar chart

Description automatically generated

Priority did not seem to impact the shipping delays in any significant way. This suggests that the overall system may be an issue in comparison to one specific priority method.

Chart, histogram

Description automatically generated

There was a slight difference in product cost with products arriving on time having a slightly lower price at $210 to NZD 222. However, the difference in cost may have been correlated to the much larger volume that arrived late.

Chart, bar chart

Description automatically generated

As initially suspected, the delay in shipping orders maybe suggesting that customers are no longer having faith in the shipping and logistics systems of the company and they are moving elsewhere; this can be mainly seen as this is almost a 50% drop in orders of customers who are making their 3rd order or more

Chart, bar chart

Description automatically generated

The warehousing situation shows an even and consistent amount of inefficacies across the 5 different warehouse blocks. There seems to be no difference at this stage as to orders being shipped from other blocks having an improved performance.

Chart, bar chart

Description automatically generated

Currently, customers are averaging around 4 calls inquiries per order, with most of the spread between the 3-5 calls range.

Chart, scatter chart

Description automatically generatedChart, scatter chart

Description automatically generatedChart, scatter chart

Description automatically generated

Due to the large quantity of data, we have analysed the data set by Shipment methods.

From the 3 charts above we can see a notable trend where all parcels on time were given a discount of less than $10, which fits the companies policy. Within this, there was an expected late on delivery rate of around 50-60%.

Chart, bar chart, histogram

Description automatically generated

Additionally, we can see a poor delivery rate between the on time and late deliveries from the histogram above. From the $10 discounts onwards, the most expensive discounts were given to customers with a late delivery, suggesting the company is losing heavily based on shipment delay.

Chart, scatter chart

Description automatically generatedChart, scatter chart

Description automatically generated

Chart, bar chart, histogram

Description automatically generatedChart, scatter chart

Description automatically generated

Furthermore, as seen through the weight to discount ratio, there is a clear pattern forming with orders

that are falling into the 2000-4000 gram weight class having a unanimous chance of being late.

Secondly, there is a disproportionate chance of parcels being late within orders that weighed under the 2000 grams section. However, a few outliers in the Shipping and Land shipment methods are insignificant to make any recommendations at this stage.

The Histogram Weight of products further reinforces this trend to the delivery status where there is a slightly higher rate of late parcels at around 70% within the 0-2000 gram delivery of, 100% guarantee of parcel lateness from 2000-4000 gram orders, while the 4000-6000 gram order section is generally lower at around 40%-50%.

Chart, histogram

Description automatically generatedChart, bar chart

Description automatically generated

We can see an even distribution between warehouse block usage from both histograms, as suggested from our initial findings. Furthermore, the mean for the discount is around 18 dollars for late orders. For orders on time, the mean discount is approximately 5.50 dollars suggesting the company is risking a 227% increase in discount costs for late delivery.

# Recommendations:

Based on these findings, we recommend the following steps of action to gain further success.

1. Focus on optimising shipment methods within the weight segments of 0-2000 grams and more so in particular of 2000-4000 grams. These have a 0% chance of arriving on time and are causing the company the most financial cost in discounts.
2. Warehouse allocation may need a review as there seem to be similar trends across all blocks on parcels being delays. Possible ways to improve this can be as follows.
   1. Review policies into stock management for faster order processing
   2. Allocate stock by warehouse block for speedier order delivery.
   3. Revival of E block to reduce usage on F block, which may lead to a faster turnaround on order processing.
3. Review contracts and processes with shipment company as all 3 services experience a similar trend in delays around 60% of parcels being late.
4. Look for potential ways to improve the customer experience as most customers call on average around 4 times to find out their order status. Ways to improve this could be as follows.
   1. Automated emails/text updates.
   2. An online tracking system for customers to view orders via the internet.
   3. Advance updates on if an order will be late with an explanation.
5. Greater awareness of the negative impacts of a late order's delivery:
   1. Reducing the problem should increase both profitability’s per order and also increase customer loyalty and engagement.
   2. Possibly look at creating other brand loyalty strategies to maintain repeat customer orders after their 3rd or 4th purchase.

# Limitations:

The dataset given was able to provide a high-level overview of customer needs and concerns. It was suitable in providing insights and understanding into what factors may have been causing late shipments and its potential cost to the company.

However, the data was limited in the following ways that may have hindered further insights to be found.

1. The data does not consider customers' previous order history and how much they spent in prior transactions.
2. The data provided did not have any information about order dates and how many days an order was late.
   1. Date and time data would have been insightful in further calculating how much a late order was costing the company through its discount guarantee policy. Furthermore, seasonal information would help show if these trends are time or seasonal based.
   2. Secondly, an order date would have helped in understanding potential costing for each shipping method. If the data can tell how often and long a parcel is delivered, we can negotiate a better rate with our delivery suppliers.
3. The data also did not include customers ordered product history, only the total weight of the sent order. Potentially there may have been 1 or 2 more oversized products that may have impacted delaying the shipment arrival. This will need to be explored across everyone's customer order history and cross-referenced with the outcome of their order.

# Conclusion:

The initial report and analysis done by the internal team have managed to pinpoint a few of the critical areas where the business Kiwi E-commerce needs to improve across in its shipping and business practices. Initial reports and public sentiment have been proven more than true. The company will need to invest and optimise its operations needs significantly to maintain and grow its position in the New Zealand Market. Any overseas expansion will like not possible until local processes are improved.

The company will also need to delve deeper and run separate analysis and reports, specifically its inventory management systems, product order history, and logistics supplier. It is likely to further factors are causing the significant delay in order arrivals and improve the customer experience that are not included in this report.