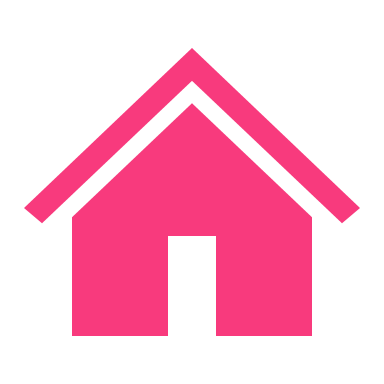
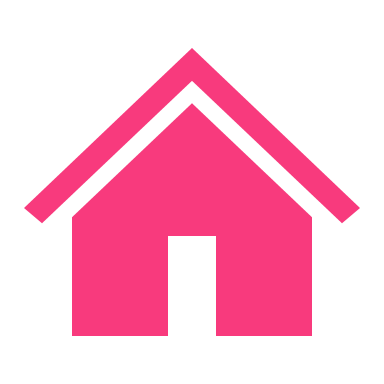
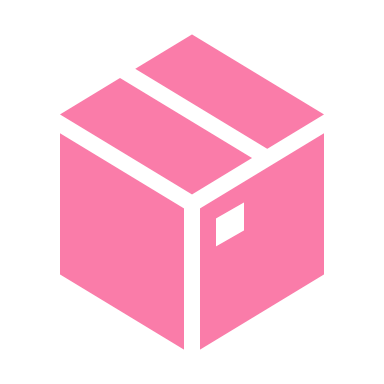
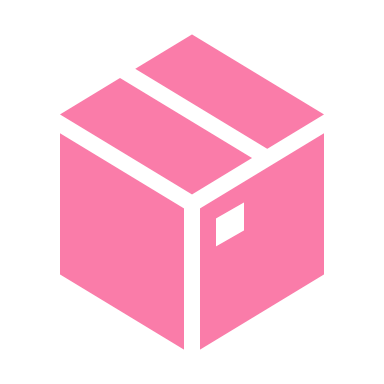
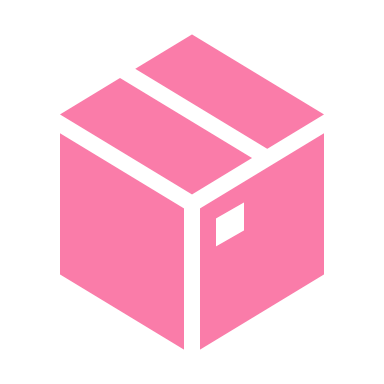
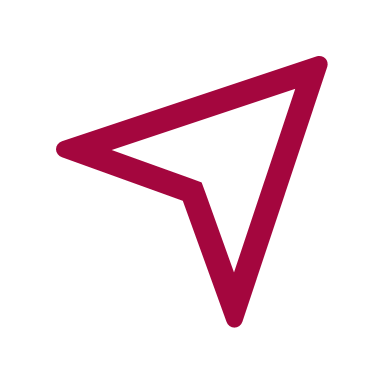
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| Juicing the numbers: final report |
| MC MANAGEMENT CONSULTING  Maxwell Bo  Chantel Morris |



## Introduction

Pure Fresh (the Client) are a juice manufacturer seeking to optimise their delivery operations. The scope of this report was to;

1. Model Pure Fresh’s in-scope operations detailed in Figure 1
2. Collaborate with the Client in order to better under their constraints and limitations
3. Within those constraints find a solution to maximise profit
4. Make recommendations



*Import Supply via One (1) Ship*

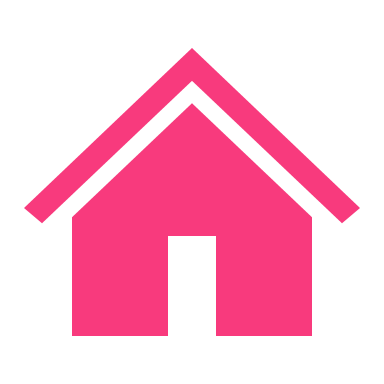
*Quarterly Operations*

*Local Demand – Brisbane, Melbourne and Adelaide*

*Local Storage Facilities – Brisbane, Melbourne and Adelaide*

*Local Factories – Brisbane, Melbourne and Adelaide*

Figure 1



## Methodology

Step 1: Model Operations

There are two varieties of cost for Pure Fresh with respect to their delivery operations. Specifically, the cost to deliver each barrel to meet the demand of a customer, and secondly, to store barrels while that demand is not there.

The objective of the model, simply, is to reduce the costs of the operation which, in effect, will seek to minimise each of these components.

Step 2: Collaborate with client to refine constraints

Throughout the term of this consultancy, the model was refined in response to further communications from the client.

The initial model, Scenario 1, was subject to the following constraints:

*Table 1*

|  |  |
| --- | --- |
| Type of Constraint | Constraint |
| Initial barrels of FCOJ in storage | Brisbane has 3200;  Melbourne had 4000 and;  Adelaide has 3800 barrels. |
| Import Ship | Has capacity of 10000 barrels |
| Non-negativity | There cannot be negative demand (i.e. customers cannot sell juice back to Pure Fresh).  There cannot be negative storage |

Furthermore, the model was constructed with 100% efficiency. At the conclusion of each quarter, the number of barrels in storage was equal to the sum of the initial number of barrels there and those added, minus those lost due to sale. There was no accounting for waste. Similarly, modelling over individual quarters may ignore the reality of the operations whereby shipments may not arrive on the 1st of every quarter, or where storage for 1 day into the following quarter may not cost the same as storage for 50 days into the following quarter, for example.

Upon further communication with the client, the following constraint was added in Scenario 2:

*Table 2*

|  |  |
| --- | --- |
| Type of Constraint | Constraint |
| Must finish forecast period with a specific number of barrels | Each port must conclude with 3000 barrels in storage. |

The final refinement of scope has been defined as Scenario 3. Here, Pure Fresh detailed the maximum storage capacity of their facilities. The following constraint then occurred:

*Table 3*

|  |  |
| --- | --- |
| Type of Constraint | Constraint |
| Maximum Storage Capacity of facilities | The storage facilities are capped to the following amount of barrels of concentrate:  Brisbane – 3900  Melbourne – 5500  Adelaide - 6700 |

## Results

The model met the needs of the Client. It was able to provide the optimal cost of delivery over the forecasted eight quarters, in each scenario.

In Scenario 1, the optimal cost of delivery over the period is $43704050.

In Scenario 2, following the Client’s addendum to the scope such that 3000 barrels of concentrate must be stored at the conclusion of the term, the optimal cost of delivery totalled $53169450. This addendum resulted in an increase of costs of approximately 21.7%, or $9465400. This is a significant cost increase.

Finally, when the limitations of the storage facilities were implemented, the optimal cost of delivery was evaluated to be $53177650. Comparatively, these constraints further increased the cost of Scenario 2 by $8200. The optimal cost of delivery in this scenario is $9473600 more expensive than Scenario 1.

## Recommendations

There are a number of recommendations to be made in light of the results presented.

First, the business case of Scenario 2 must be questioned. By mandating 3000 barrels of concentrate in storage at the conclusion of the forecast period, the cost of operations for Pure Fresh will increase by approximating 21.7%. Considering that prolonged storage of concentrate creates a cost in and of itself, the necessity of this constraint ought be challenged.