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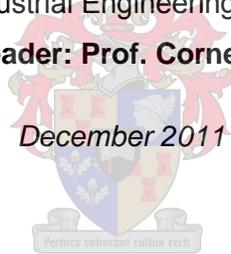
Pick n Pay Online Shopping

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Final year project presented in partial fulfilment of the requirements for the degree of Bachelors of Industrial Engineering at Stellenbosch University.

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December 2011





Declaration

I, the undersigned, hereby declare that the work contained in this final year project is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Sign on the dotted line:

.....

.....

Datum

Date

***ECSA Exit level outcomes references***

The following table include references to sections in this report where ECSA exit level outcomes are addressed.

Exit level outcome	Section(s)	Page(s)
1. Problem solving		
2. Application of engineering & scientific knowledge		
5. Engineering methods, skills & tools, incl. IT		
6. Professional & Technical communication		
9. Independent learning ability		
10. Engineering professionalism		



Synopsis

The topic of this project is online shopping at Pick n Pay. The service is currently inefficient and needs to be improved. Customers are sometimes left unhappy as they often do not receive their orders on time or receive the wrong items or items are left out of the order as they were not available in the store, although the website indicated that they are. Due to the initial problems, some of the customers who started to use the service regularly have not become inactive. Pick n Pay now needs to improve this service in order to win their customers back and turn this into a profitable business.

To remodel the current online shopping model a number of steps have to be taken. In this report other online shopping companies are investigated to obtain reasons of their success or failure in order to ensure Pick n Pay avoids making the same mistakes and adopts a successful approach. An analysis of Pick n Pay's only online grocery shopping competitor in South Africa, Woolworths, is then undertaken.

The current Pick n Pay model is analysed from beginning to end and the objectives of the new model are identified. Problem areas are then identified and solutions are provided in order to solve these problems and/or improve the current model.

The focus areas include the website, the selection of stores used for online shopping orders, in store methods (picking, checkout, etc.), delivery time slots and transportation methods. Results are then concluded and a new model for the service is provided.



Opsomming

English summary of the English **final year project** (less than 500 words).



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Terms of reference

The assignment is to evaluate and redesign the current online shopping service at Pick n Pay. Existing online shopping businesses must be researched in order to understand the business better. The different processes involved in such a service must be analysed and the problems within these processes identified. The problems must then be investigated in order to improve the system, redesign the current model and make this an efficient and profitable service.



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Glossary

Picker	Person responsible for completing a customer order by collecting the order items from the store shelves
Packer	Person responsible for packing customers' orders into bags and delivery bins
Walking	(in the context of time studies) Picker moving between areas of two items in an order
All Slot	This refers to a delivery slot which spreads across all the other slots i.e. an all day delivery slot
BRP	Business reengineering process
Franchise Store	Store that operates under the company name (Pick n Pay) but is privately owned
Corporate Store	Store that is owned by the company itself
Hypermarket	Mass market store that offers items and departments other than general groceries
Hawthorne Effect	



1. Introduction

This report is a study of an online shopping business, the processes used and improvements that should be made to ensure a more economical and efficient business. Pick n Pay online shopping will be used as the project's focus where their processes and systems will be analyzed and improved. Certain aspects of the business which are in need of improvement have been chosen to be evaluated and modified. The Cape Town area, and in particular the Kenilworth Store, will be used for assessment in this project.

Online shopping is very new in South Africa and there is still a lot to be learnt about the business and the best ways in which to set it up and run it. Many companies worldwide have attempted an online shopping business, using various methods. Some of these methods have failed and some have been a success. The patterns and methods of success and failure have been studied and will be used in the alterations and setup of the Pick n Pay business. Some of these companies used a set up similar to Pick n Pay where they work directly from their existing stores. Other companies were new, created exclusively for online shopping, run directly from a distribution centre and operated online only.

Woolworths is the only other South African company to offer grocery online shopping. An analysis of their systems and methods is completed to evaluate the differences from Pick n Pay and determine the best methods to be implemented.

Pick n Pay's current model is evaluated and defined. The problem areas are identified and further analysis and improvements are made using various methods.



2. Research of Foreign Online shopping Companies

Although this report is based on a South African company, it is worthwhile looking at statistics in other countries and applying them to Pick n Pay in South Africa. The companies studied in the section 2.1 were specifically chosen because they all took different approaches and a comparison of what works and doesn't work could be made. In America, the average household makes 2.3 visits to a grocery store a week and it is estimated that an average grocery shopping expedition takes 47 minutes excluding loading and unloading of the car and driving to and from the shop. Although the statistics in South Africa will not be exactly the same, it is clear that the use of online shopping could save people a lot of time and effort. This would be ideal for moms and people with busy schedules. (Richard R. Johnson, 2000)

Theoretically, with online shopping a company should be able to offer lower prices on their products as they no longer have to pay for checkout clerks, parking lots and display cases but in reality it is not as cheap to set this business up as it appears. The initial stages of online shopping are the make or break of the business as will be seen in the study of different companies to follow. All the companies that were studied started out making a loss until their customer base increased. Once the business is established and making a profit, with a big customer base, cost can be cut dramatically and a large profit made. In general, the larger the customer base becomes, the closer customers are to each other therefore the shorter the travelling distances between deliveries and the larger the demand. Therefore the lower the costs and the higher the turnover and profit will be.

Forrester research predicted that specialty online grocers would be more successful than full-service online grocers. The main reason for this is the difficulty of changing customer's behaviour. Another reason is that specialty online shopping depends merely on the number of people with internet access while full-service online shopping strongly depends on the specific customer's demographics and willingness to change their behaviour. When Webvan failed and had to shut down, Amy Nobile, a spokeswoman for the company said "Certainly, in hindsight, no one knew what was going to happen in the marketplace. No one realized the amount of education it would take to get customers to change their buying habits" and shop online for groceries. (Weiss, 2001) The comparison of predicted spending for America for specialty and full service grocery stores by Forrester is shown in figure 1. (Richard R. Johnson, 2000)

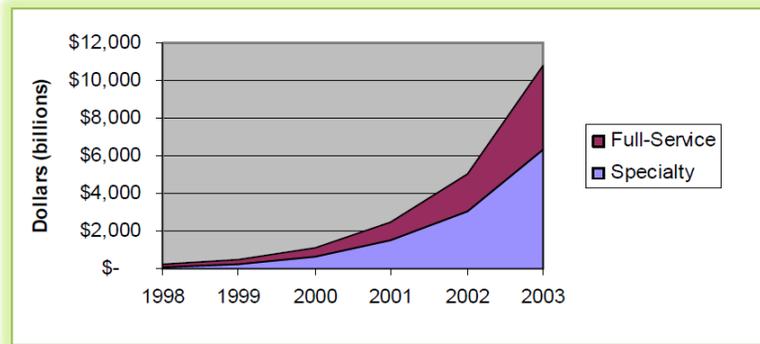


Figure 1- Projected electronic grocery spending of approximately \$500 billion total industry (Marius Janson, 2007)

When online shopping companies began to open, existing grocery store owners were sceptical about the success of such a business due to the habits of grocery shoppers. Scher, Landover's spokes person said "customers like to squeeze the tomatoes." Like most other stores, they had no intention of rushing into the industry. (Richard R. Johnson, 2000)

This view on the new industry did not last long. By 2000 existing grocery chains were starting to set up their online service and many of them started by giving the customer the choice of collecting their order from the store or having it delivered. As explained above, the setting up of this service was not as easy as expected and the initial interest was poor. In many cases the companies failed and cancelled the service after making a loss. (Richard R. Johnson, 2000)

Companies learnt from each other and eventually a success was made of this new industry.

Worldwide it is clear that the start up of such a business is slow but once people take to the idea of online shopping, the business flourishes. Pick n Pay is currently in the start up phase and is facing the troubles of customers unwilling to change their habits of shopping in a grocery store. It is important to ensure that the best service is offered to those customers who are currently using the service so that they stay with the Pick n Pay service and encourage others to join them. An unsatisfying service could result in the lost of customers and a bad reputation for the online business as well as Pick n Pay's customer service as a whole. The revamp of processes completed in this project



will allow Pick n Pay to offer a better service and ensure customer satisfaction and is vital for the long term success of the business.



2.1 Success, failures and lessons learned by online shopping companies

In the study of online shopping companies, the differences in approach and the aspects of each company which worked and didn't work are investigated.

Two types of online shopping businesses will be looked at, existing grocery stores offering online shopping as an extra service to customers and new online shopping businesses set up to provide this service only. Schnucks and Colruyt are existing grocery stores which started online shopping as an extra service to customers. Webvan, Fresh Direct, Peapod and Streamline started up as businesses that exclusively sold groceries online.

2.1.1 Existing Stores offering online Shopping as an extra service to customers



2.1.1.1 Schnucks

Schnucks started as a family-owned grocery store in St. Louis in 1939. Today it is the fiftieth largest chain in America. It focuses on attracting affluent customers and offers a large variety of items, friendly staff and an attractive ambience. The company is highly sophisticated as far as the use of technology and IT is concerned using self checkout stations, electronic radio receivers placed on trolleys to reduce loss and theft and many other technologically advanced processes and items. (Marius Janson, 2007) (Schnucks' history, 2011)

The company started conservatively with their online shopping expansion. They did not expect much and initially serviced just 75 to 100 customers per week. They ensured that these customers were 100 percent satisfied with the service and only grew the business when they felt they were able to handle more customers and still provide a service of the same standard. They saw this as a branch to the business that would start slowly but had potential to become a huge part of Schnucks in the future. They did not want to spend a lot of money on the online shopping service as they were unsure of whether it would be a success or not, hence the conservative approach. In 1993 they were forced to shut down the online shopping service due to contractual obligations. (Marius Janson, 2007)

In 2003 the online service was put back into operation. The reason for this was that other grocers had begun to offer the service and Schnucks merely wanted to keep competitors



at bay. They had no intentions of growing their online service as they felt it was only marginally profitable but with the increase in demand they were forced to expand but refrained from developing the service to its full potential. (Marius Janson, 2007)

In order to minimize costs they worked directly from existing stores where the store employees could pick the items and they outsourced the deliveries to a logistics company. Although their intentions were never to grow this service to a point of great profit, their approach was successful and ideal as starting blocks for what could grow into a major business. They kept the costs low to reduce the chance of great losses if the service was to be a failure but ensured they were able to fulfil the demands of their customers.



2.1.1.2 Colruyt

Colruyt opened its first store in 1965 and today is the third largest grocery chain in Belgium. Colruyt guarantees the lowest prices and therefore their target market differs from that of Schnucks. Colruyt has fifteen company employees who are primarily dedicated to visiting other stores, finding adverts and altering prices to ensure that their prices are lower than competitors at all times. (Marius Janson, 2007)

Colruyt runs a highly efficient business and likes to keep their throughput as high as possible. They do this by scanning items at the checkout counter and then moving the customer to another counter to pay in order to free up the checkout clerk so that they can help the next customer as quickly as possible. (Marius Janson, 2007)

Colruyt was sceptical about how economically viable the online shopping service could be for their company. They knew that people would be interested in the service but to what extent they were unsure. It was also unknown how much people would be prepared to pay for this service. They chose to wait and see the success of other companies before offering the service themselves. After observing they decided to test the waters by offering online shopping for wine. Originally customers could download order forms from their website, fax them to the store and later collect their order from their store of choice. Once Colruyt was convinced that there was a promising future with online shopping, they offered a delivery service and ordering via their website. They then added



food as well as other non food items and were eventually offering a full online shopping service. (Marius Janson, 2007)

Their approach was initially conservative and allowed them to test the system without making any large investments that could cause damage to the business but eventually grew online shopping into a large branch of the Colruyt Company.

2.1.2 Newly Created online Shopping Businesses



2.1.2.1 Webvan

Webvan was a company started purely as an online shopping business. The business was started with little research being carried out and under the assumption that many people dislike shopping for groceries and that their client base would be large from the start. The founders of the company were extremely ambitious and planned to develop distribution centres capable of completing 8000 orders daily in twenty six of America's largest cities. They started in San Francisco in 1999 by developing a \$35 million distribution centre. Spending this kind of money with no customer base or knowledge of the perspective customer base was extremely risky, especially in what is now known as a slow growing business. Two years later the company filed for bankruptcy. (Marius Janson, 2007)

Reasons for the failure of this company include the lack of research of the founders. They had a good initial idea but failed to investigate the demand for the service as well as how lucrative a business of this type would be. The management also lacked experience in the grocery retail industry and therefore did not know the demand for the service, how to price items or deliveries or how to logistically arrange the deliveries. They also failed to investigate the troubles of other companies such as Tesco's who had struggled to make online shopping a success in the early stages. They seemed to face many of the same problems as Tesco's which could have been avoided had they done sufficient research. The manager's, with their lack of knowledge in the grocery retail industry, relied heavily on the internet's technological aspects and this resulted in faulty planning and unrealistic customer demand expectations and therefore this company



never managed to make it from radical/ visionary to radical/pragmatic as planned. (Weiss, 2001) (Glasner, 2010)



2.1.2.2 Fresh Direct

Fresh Direct, like Webvan, was a company started purely as an online shopping service. They did their research and learnt from the mistakes of companies such as Webvan, HomeRuns, ShopLink and Streamline which had all tried to develop similar businesses using different methods. Some failed and some managed to make a success of the business and are still running today

Fresh Direct started in New York City where they could service many people in a close proximity of each other. This meant short travelling distances between deliveries. The founder of Fresh Direct, unlike those of Webvan, had a background in the grocery retail industry and with the cheap purchase of Webvan's mechanical order-picking hardware and the well designed SAP system, he was able to create a successful business. The founder understood the retail industry, knew what the demand would be and understood that this would be a slow developing business. It was difficult to get started and initially not very lucrative but grew rapidly and eventually the business expanded to other American Cities. (Fresh Direct History, 2009) (Marius Janson, 2007)



2.1.2.3 Peapod

Peapod was a devoted online shopping company. It started in Evanston, Illinois by the Parkinson brothers in 1989 and by the end of December 1999 had a total of 1020 employees and by May 2000 had expanded to eight different cities. (Background on Peapod, 2011) (Richard R. Johnson, 2000)

The company started out with personal shoppers who would enter a super market and complete the shop for a customer. They received a six percent discount from supermarkets yet it still seemed to cost Peapod \$40 dollars for every \$100 order. In 1998 the company developed centralized distribution centres and instead of completing the



orders in grocery stores worked directly from their own distribution centres. By centralizing the company their profits increased by 308 percent. The detail of the savings and new profit can be seen in figure 2 (Richard R. Johnson, 2000). It is interesting to see where possible savings can be made. With the old model, Peapod worked on a system where customers had the choice of paying \$5 a month and 5 percent of their total order value, \$0 monthly and \$9.99 per delivery, \$5 monthly and \$5 per delivery or \$19.95 monthly and no delivery fee. This allowed for the accommodation of all customer situations and allowed customers to choose the option that worked best for them. This system worked out to an average order cost of \$8.50 without the monthly charges. They offered two hour delivery slots (chosen by the customers) with a twelve hour lead time. Their order sizes were on average five times the average in store order sizes which indicates that either a lot of companies were using the service or people preferred to do larger online shops instead of many small ones as they would do in a store. (Richard R. Johnson, 2000)

	In-store	Warehouse
Grocery Sales	\$ 115.00	\$ 115.00
Consumer Fees	\$ 15.75	\$ 8.85
Total Revenue	\$ 130.75	\$ 123.85
COGS	\$ 102.95	\$ 85.85
Gross Profit	\$ 27.80	\$ 38.00
Picking, Packing, and Delivery	\$ 14.25	\$ 19.05
Other*	\$ 4.60	\$ 8.40
Variable Operating Expenses	\$ 18.85	\$ 27.45
Fullfillment Center OH	\$ 5.85	\$ 2.65
City OH	\$ 1.80	\$ 2.60
Net Contribution	\$ 1.30	\$ 5.30

Figure 2- Peapod profitability comparison, traditional retailer model vs. distribution centre model

Despite the seemingly good service and successful methods, at the end of 1999 the firm had achieved revenue of \$73.1 million and a net loss of \$28.5 million. In 2000 a Dutch food retailer bailed Peapod out with \$73 million and in return received 51 percent ownership and an entry into the American online grocery market. As of May 1, 2000, Peapod's market cap was \$55 million based on share prices of 3 1/16. Today Peapod is America's leading online shopping retailer and serves 22 U.S. markets. (Richard R. Johnson, 2000)



Roadnet Technologies is the company they outsourced their deliveries to and have continued to use then, even when the company has grown large enough to justify owning their own trucks. Peapod has a good relationship with Roadnet and believes that outsourcing their deliveries is their best option. (Peapod Delivers 'Express Line' Service Through Superior Routing)



2.1.2.4 Streamline

Streamline was founded in 1993 in Westwood, Massachusetts. By May, 2000, Streamline operated in 3 markets across America and had plans for further expansions. This company worked from a centralized distribution centre and differed from other online shopping businesses in that for \$30 per month, customers could rent a refrigeration box which would be installed in their garage or home. The items they ordered online could then be stored in this refrigerator and it eliminated the need for the customer to be home when the order was delivered. (Richard R. Johnson, 2000)

Each driver, working for Streamline, was fully trained as a customer service representative, allowing them to make on-the-job decisions on behalf of the customer. The refrigeration boxes also contained note pads so that the customer could communicate with the driver and the company therefore always knew how the customer felt about the service being provided.

In 1999, Streamline reported a net loss of \$19.5 million on revenue of \$15.4 million. The market cap on 1 May, 2000, was \$83.7 million based on a share price of 3 ¾. The number of customer orders increased by 93% to over 73000 orders for the first quarter of 2000. (Richard R. Johnson, 2000)

2.1.3 Conclusion

Pick n Pay is in a similar situation as Schnucks and Colruyt as it is an already established grocery retailer trying to incorporate the online service into the business.

Pick n Pay, like Colruyt, is attempting to turn this into a profitable branch of the business but is taking a slightly different approach. Although there are many companies who have successfully installed the online shopping service for Pick n Pay to learn from, they have taken a rather radical approach. Instead of starting with a testing item, such as wine in the case of Colruyt, they have gone straight to offering a full online shopping service country wide.



From the comparison of the above studied companies, Webvan and Fresh Direct, it can be seen that a small scale approach is safer due to the slow growth of customer density. The founders of Webvan were very ambitious and with their lack of knowledge and eagerness to grow the company quickly ended in bankruptcy. Pick n Pay launched the online shopping service country wide and it would now be damaging to the company name and upsetting to customers to retreat from areas where the service is already offered. However, it would be ideal to perfect the service on a smaller scale first. As learned by Colruyt who offered a service to keep competitors at bay and had to continue the service in order to not upset customers. Pick n Pay should have ideally begun the service in one city and grown the business only when they had the expertise to do so with the greatest of customer service.

Having said this it would not be good for the company name to retreat from areas now so the operations of the business have to be improved country wide to ensure customers get the service they are expecting and are not lost as online shopping customers forever, due to bad service, while at the same time optimizing the system to ensure it is as profitable as possible.

It is clear from the study of these companies that with a business that is a slow developer in terms of customer base, it is essential to begin with as low costs as possible to avoid a loss being made by the company. Pick n Pay seems to be using the right approach with operating the service directly from stores and not having spent money on the development of distribution centres until the business is big enough to utilize the capacity of a distribution centre. Having said this, it is important to look at costs of setting up online shopping at more stores and having shorter travelling distances to customers versus using fewer stores and travelling further distances while the service is still on a small scale. It is also important to look at where costs could be cut with integrating the responsibility of store staff and online shopping staff as separate staff is currently hired for online shopping duties. This is where a franchise store could possibly be more beneficial in running the online shopping service as the owners are in store, passionate about the success of the business and presumably aware of every staff member they have and what they are responsible for. From experience in a corporate and franchise store it appears that the control and behaviour of staff is a lot more efficient in a Franchise store due to the passion of the management. (Glasner, 2010)



2.1.3.1 What was learned and should be implemented from the research Undertaken:

After researching a number of online shopping companies, the trends that lead to a successful business were the following. (note: these points are relevant for an online shopping business in its development stage which is the current stage of Pick n Pay Online shopping)

- Research other companies' successes, methods and failures (don't repeat the mistakes)
 - Have knowledge of the grocery industry
 - Start conservatively and keep costs to a minimum.
 - Ensure 100% satisfaction of customers
 - Work from stores rather than distribution centres
 - Start with lots of customers in small area before expanding
 - Start with a small, limited service and get it 'right'; before offering a bigger or better service
 - Make the service as easy and convenient for customers as possible
 - Use in store staff for item picking to cut costs
-



3. Research of South African Competitor: Woolworths

Woolworths is Pick n Pay's only online grocery shopping competitor in South Africa. Although their general target market is slightly different as Woolworths targets a slightly more affluent market, when it comes to online shopping, the current market is so small that their target market is very much the same. This means that for Pick n Pay to be successful, they must offer a service that is as good as or better than the service offered by Woolworths. In order to be beat the competition, it is important to understand the competition and how they work. Unfortunately a visit to the Woolworths online shopping stores was not possible due to confidentiality but a survey was completed by the head of online shopping at Woolworths, Keith Scott. The filled in survey can be viewed in Appendix C. The following results of the survey are discussed in this chapter.

3.1 Store allocation

At Woolworths their original plan was to run their online shopping business from a distribution centre but, like Pick n Pay, with research concluded that the set up costs would be extremely high and with this being such a new business, it was better to work from stores while the customer base is still small. Eventually they would like to grow big enough to be able to work from a central distribution centre.

Woolworths has 18 stores around the country offering online shopping, two of which manage the fulfilment of the Cape Town area. They also have a store in Paarl and in Somerset West.

When selecting the stores to be used by Woolworths, the following factors were considered:

- The size of the catalogue at the store (stores with the largest catalogues were mainly chosen),
- Physical location (they use a rule of travelling no further than 15km and therefore chose stores that would give them the most efficient coverage of the highest density areas),
- operational conditions (the position of the store was taken into consideration as a store in a mall or on a busy road would be difficult to work from)



Woolworths works on a model where they would preferable have many stores with short travelling distances (max of 15km from store). (Scott, 2011)

3.2 Picking Methods

At Woolworths they use a productivity measure based on average order sizes. It is known that a picker is capable of picking a R500 order in the space of an hour. Orders are allocated to pickers and a deadline set for the order to be complete according to the known picking rate.

At Woolworths the day begins at 6:30am and 80 percent of their orders for the day are picked before the store opens for trade. This means that staff has to be at work earlier but orders will be ready on time and the picking process will be a lot faster and more efficient

Online shopping orders are cashed up at the store checkout tills used by the customers. This means that a separate till and staff member is not needed for checkouts which reduces costs

One of the biggest problems is the accuracy of the indicated available items on the website. Woolworths claims that they are about 10 percent out of stock at a gross level but close this to 1 percent with substitutions.

(Scott, 2011)

3.3 Delivery Time slots

Woolworths started out with two hour delivery slots and an all slot at a discounted rate. This has since changed due to customer feedback and the demand put on pickers with regards to deadlines.

This year, Woolworths has managed to get 97.3 percent of orders to customers on time, At Woolworths they try to credit the customer for the items that are wrong or missing and avoid returning to the customer with the item unless it is absolutely necessary. This is a more economical approach and realistic as far as costs are concerned. The customer is going to be upset with the correct order not being delivered whether it is delivered later or not. This once again traces back to activities at the store, if picking is accurate and efficient these losses will be a very small concern. (Scott, 2011)



3.4 Conclusion

Evident from the information received about Woolworths, they have managed to create an efficient process at what appears to be low costs. Unfortunately, due to the inability to visit their stores or have access to data apart from what was provided by Keith, it is difficult to know exactly how efficient or economical their process is.

Having said this, the information provided is very useful and allows a comparison to be made between Pick n Pay and Woolworths. There are aspects of the Woolworths model mentioned in this chapter that can possibly be implemented at Pick n Pay in order to improve the Pick n Pay model. A comparison between Pick n Pay and Woolworths is shown in Table 1 as well as the aspects of the Woolworths model that could be implemented at Pick n Pay.



	Pick n Pay	Woolworths
Store or distribution run?	Store	Store
Type of store used	Corporate	Corporate
No. of online shopping stores in South Africa	13	18
No. of online shopping stores in Cape Town and Winelands area?	2	4
Main considerations when picking online shopping stores	Operational conditions	Operational Conditions Catalogue Physical Location
Maximum distance travelled to customers	Unlimited	15 km
Picking Speed	1 item per minute	R500 order in 1 hour
Picking time	8:00 till 5pm	6:30am till 3pm
When are the majority of orders picked?	14:00 to 17:00 (for next day) 80% of order	6:30 to 8:00 80% of order
Check out till	Separate tills for online shopping	Store tills used
Out of stock	15%	10%
Out of stock after substitutions have been made	5%	1%
Delivery time slots	4 hour slots	Started with 2 hours time slots and a discount all day slot. Moved to larger time slots.
Items missing from order	Sometimes replace order later that day or the next day or credit customer	Avoid delivering missing items as far as possible. Rather credit customer
Size of catalogue	large	Smaller

Table 1- Comparison of Pick n Pay and Woolworths



(Cotterell, 2011) (Scott, 2011)

Things Pick n Pay should learn from Woolworths:

- Pick n Pay needs to put a limit on the distance they travel to customers
 - Pick n Pay needs to find a way to reduce set up costs in order to have more stores running online shopping and shorter travelling distances
 - Pick n Pay needs to take more variables into consideration and do a proper evaluation when selecting stores used for online shopping
 - Picking methods need to be re-evaluated
 - Picking times need to be re-evaluated
 - Online shopping processes such as ringing up, storage of orders, etc at the store need to be evaluated and changed
 - Delivery time slots need to be evaluated
-



4. *Pick n Pay*

In chapter four we begin to investigating the Pick n Pay process in order to re-engineer the business process. The diagram in Figure 3 shows the steps of Business Process Reengineering. BRP is the rethinking and redesign of business processes to achieve drastic improvements in critical, contemporary measures of performance such as quality, cost, service and speed. (Subramanian Muthu, 1999)

The process starts by identifying the current, as-is model. This has already been done in proceeding chapters. The process is then analysed and areas needing improvements are identified. Next the to-be model is designed by improving parts of the as-is model. The last step, testing and implementing the to-be stage, will not complete as this is beyond the scope of this project. However, reasoning and analysis for the design decisions made will be provided to ensure the best processes are used.

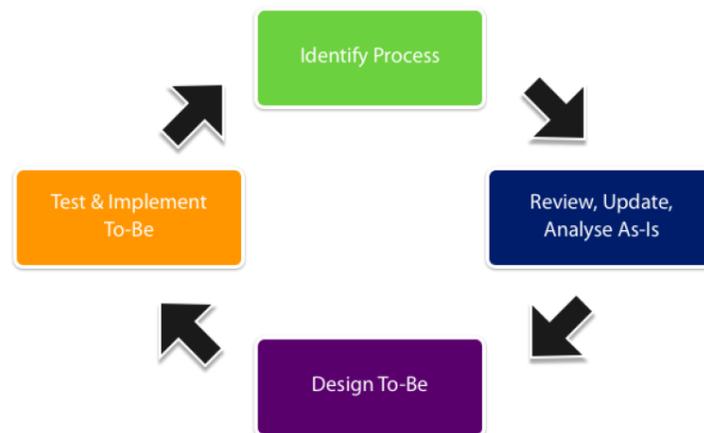


Figure 3 - BPR Process (Prof Niek du Preez, 2010)

4.1 Review *Pick n Pay's As-is Model*

Online shopping in South Africa is a new concept. The mind set towards shopping online has been changed in Europe and America but in South Africa people are still very set in their ways and prefer to do their shopping themselves. Pick n Pay is currently struggling to change the mind sets of the public in order to convert them to shopping online.



The current Pick n Pay model is shown in the flow diagram in Appendix J and will be explained in this section. The highlighted blocks in the diagram will be discussed later in this report.

Pick n Pay currently runs their online service directly from stores and does not use a distribution centre. Currently 13 stores offer online shopping country wide. Only corporate stores are used and there is no limit on how far trucks will travel from a store to deliver orders. In the Cape Town area (on which this study is conducted) there are two stores, Kenilworth and Brackenfell, which service the whole of Cape Town as well as Somerset West, Strand, Gordon's Bay and the Winelands. (Cotterell, 2011)

4.1.1 Placing an order

Customers log onto the Pick n Pay online shopping website. They then either sign in or register on the website. Once they have done this the website can identify the user, where they are located and which store services their area.

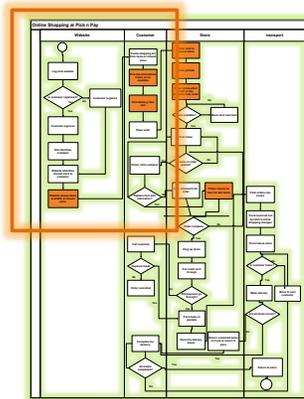


Figure 4- Placing an order

The customer then decides what they want to do (go banking, recipe centre, catalogues or select department). We are investigating online shopping so we assume the customer chooses the department they want to shop from. They then select an area of that department and the type of

product they want to order. A catalogue appears with all the items that the store offers in that category. The customer adds items to their "trolley" and then returns to the same department or another to select more items. Once the order

is complete the customer selects the 'checkout' button and selects a delivery time slot. The two time slots are 9:00- 13:00 and 13:00- 17:00. Orders must be placed at least two days before delivery time. Available time slots are indicated. The customer then confirms the order and agrees to a delivery charges of R60, enters their credit card details and logs off. Appendix K illustrates the process of placing an order as described in this section. The orange blocks will be discussed later in this report. Figure 4 illustrates where in the online shopping process (Full image of figure 4 shown in Appendix J) placing an order takes place.



4.1.2 The In Store Process:

After the order has been completed by the customers, it is sent to the closest online shopping store for the order to be completed. Orders are printed the afternoon before they are due and, one at a time, collected by pickers.

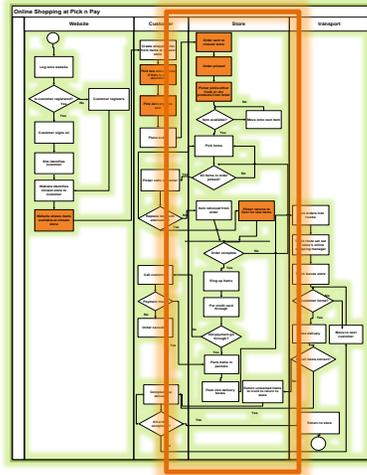


Figure 5- In Store Process

The picker takes the order and moves into the shop to pick the dry products. Items are picked from the shelves and where items are out of stock the picker either selects an alternative or leaves the item out and marks it off. Some of the items that have not been packed on the shelves yet are collected from the store room and added to the order. The picker then returns to the online shopping room. The trolley with the items and the order sheet is then left in or around the online shopping room. The next morning staff arrives at work at 8:00am. They complete the orders from the day before by picking the fresh produce items and adding them to the order. Again, any items that are not available are marked off. The picker then returns to the online shopping room and calls the customer to inform them of items not available, tell them what the alternate options are and let the customer decide if they would like to replace the items or remove them from the order. The picker then returns to the shop floor again and makes adjustments to the order accordingly. The order is then returned to the online shopping room and left in the trolley with the order form. The order is later cashed up at the online shopping till and packed into bins ready for delivery. The credit card is put through and payment confirmed. (Jackson, 2011) The Picking Process explained is illustrated in details in the flow diagram in appendix L. Figure 5 illustrates where in the full online shopping process the in store activities take place. Appendix J shows a full size diagram of the flow diagram in figure 5.

4.1.3 The Transportation

After the order has been cashed up, packed into bins and the customer has been billed successfully, the online shopping manager decides the route of the truck by manually looking at the day's orders and deciding on the best route. There are three available

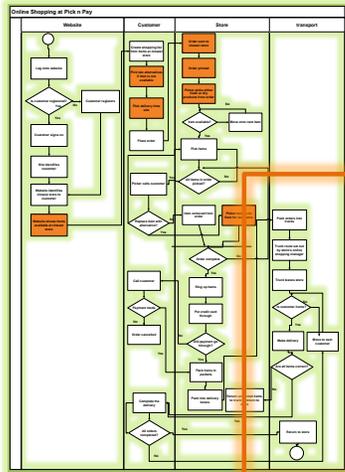


Figure 6- Flow Diagram showing where transport fits into process

trucks so she splits the covered Cape Town area into two areas and sends one truck to each. The third truck is used if there are a lot of morning orders or it is held behind if the morning trucks are not going to be back in time for the start of the afternoon delivery slots. The trucks then deliver the orders, check the order with each customer, return any unwanted items and gets ready for the afternoon order. (Jackson, 2011)

If an item has been left out of an order, Pick n Pay will try to avoid travelling back to the customer but to keep customers happy, if the customer really wants the item they will return that afternoon or in the morning and deliver the item. Figure 6 illustrates where the delivery

process fits into the full online shopping process. (The full online shopping process is shown in Appendix J)



4.2 Problems with Pick n Pay's Current Model

4.2.1 Website

The current website is user friendly and well set out. However, the area identifier is not up to date and therefore does not pick up new areas or addresses. The people at these addresses are therefore unable to use the service and are lost as customers. In the

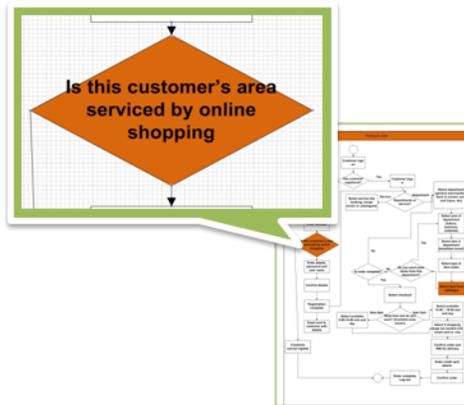


Figure 7- Customer location in Ordering Flow Diagram

current model there is also no limit on how far trucks will travel to deliver an order. Therefore a customer can register anywhere in South Africa to order from online shopping. They may be called later to be informed that their order cannot be fulfilled. The website should be designed so that certain areas are demarcated as online shopping serviced area and only people within these areas should be able to register online. As the website stands, some people within serviceable area unable to register while people in far out areas can. A lot of business is being lost and disappointment being brought to those customers who cannot use the service. Figure 7 illustrates where the decision of servicing a customer or not fits into the process.

When a customer logs on to place an order, the catalogue of the specific store their order will come from appears. However, the website only shows the items that the store offers and not the availability of the items. This causes a lot of out of stock items to be ordered. Figure 8 shows where this fits into the process of placing an order.

As the website stands, some people within serviceable area unable to register while people in far out areas can. A lot of business is being lost and disappointment being brought to those customers who cannot use the service. Figure 7 illustrates where the decision of servicing a customer or not fits into the process.

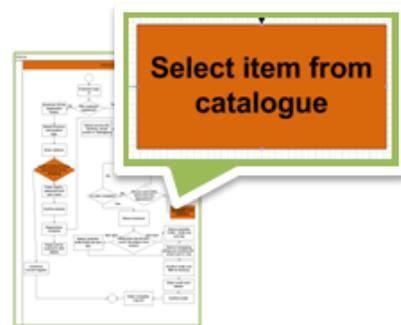


Figure 8- Viewing of catalogue in Ordering Flow Diagram

4.2.2 Online Shopping Store selection

Pick n Pay currently uses corporate stores to fulfil their online shopping service. As mentioned before, there are two stores used for online shopping in the Cape Town area that fulfil the whole of Cape Town, Somerset West, Strand, Gordon's Bay and the



Winelands. This means that far distance are travelled due to no limit being put on how far the trucks will travel.

The current Pick n Pay model has large overheads and set up costs and therefore they focus on rather having fewer stores and travelling further distances as they pay an outsourced logistics company a set rate for delivering the orders.

The main factor taken into consideration when picking the stores to be used for online shopping was operational conditions. Very little consideration was made for the location of the target market and therefore the distances that would be travelled from the stores. Originally the catalogue of the store was not taken into consideration but this is starting to be considered as the plan is to rather use Hyper markets as they offer more products but this will increase travelling distance, possibly decrease efficiency in picking as the stores are a lot larger and complicate an already inefficient process with the extended number of products from different departments being offered. (Cotterell, 2011)

4.2.3 Picking methods

At Pick n Pay the times allocated to pick an order are extremely long and pickers are able to complete the order in about half the time allocated when the store is full of customers. This is extremely inefficient as it allows pickers to think they are working at an acceptable rate when they are not.

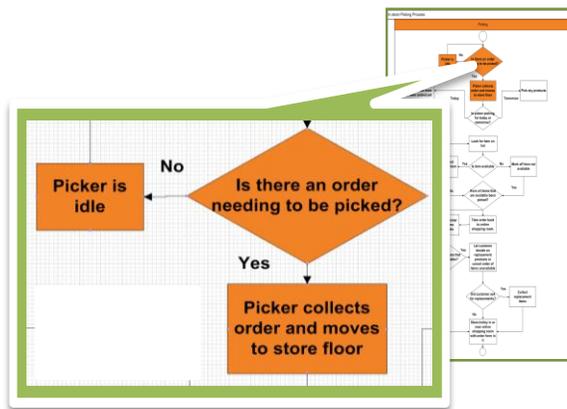


Figure 9 - Picker getting order to pick in Picking Process

At Pick n Pay all picking is done during trading hours which means pickers have to deal with shoppers getting in their way and slowing the picking process down. Hand held scanners are being considered for use in the future where pickers will scan the items as they enter the trolley and therefore the check out at the end of the picking process will be a lot quicker.

Picking before hours was considered but eventually it was decided that it would not be possible due to union laws and unhappy staff. This option will be investigated further on in this report. Figure 9 illustrates an order being assigned to an idle picker.

Hand held scanners are being considered for use in the future where pickers will scan the items as they enter the trolley and therefore the check out at the end of the picking process will be a lot quicker. Picking before hours was considered but eventually it was decided that it would not be possible due to union laws and unhappy staff. This option will be investigated further on in this report. Figure 9 illustrates an order being assigned to an idle picker.



There are two separate checkout tills in the online shopping facility used only for online shopping orders. The checkout clerk is busy for a large portion of the day but the cost of setting up separate checkout counters is possibly unnecessary. Whether these tills are economically viable will be investigated. Although the check out of online shopping items at Pick n Pay does not interfere with the customers in the store, it means higher costs of equipment as well as having to



Figure 10- Calling Customer in Picking Process

employ extra staff member. There are currently two tills and one staff member so one till stands idle and the reason given for the second till is, it is there in case the other one breaks. (Jackson, 2011) This is not a very efficient process. Because of the inaccuracy of the website and order placement, pickers generally return to the store three or four times to complete one order. They also sometimes call the customer twice which is not very efficient and doesn't make the process very convenient for the customers. (Cotterell, 2011). Figure 11 illustrates where in the picking process this problem appears. The flow diagram in figure 10 can be viewed in Appendix L.

4.2.4 Delivery time slots

Pick n Pay offers four hour delivery slots, which are illustrated in figure 12, where customers pick their preferred slot. The full flow chart in figure 11 can be viewed in Appendix K. Smaller delivery slots are being considered for when they are able to handle it with a more efficient process. The major concern is getting deliveries to customers on time i.e. customer satisfaction. A delivery that does not arrive on time is possible the quickest way to lose a customer as it is inconvenient and the main attraction to using online shopping is convenience. As long as the process is inefficient and current demands

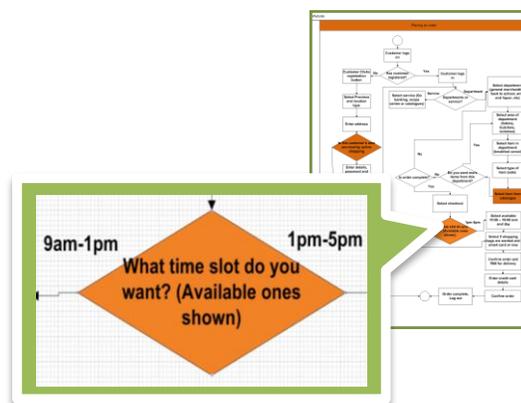


Figure 11- Time Slot selection in order placing



are not being completely fulfilled, smaller delivery slots cannot be considered. (Cotterell, 2011)

Pick n Pay still delivers items to customers late on a more regular than acceptable basis but with the improvements to be made at the store, the success rate should increase.

A major loss at Pick n Pay comes from items in an order being wrong or missing. This often results in trucks having to return to the address to drop off the missing item. This doubles the travelling costs and has a very big effect on the profits or losses made as well as customer satisfaction. (Cotterell, 2011)



5. *The Pick n Pay Plan*

5.1 *The Aim for Online Shopping At Pick n Pay*

The current online shopping service does not generate a profit. Although this is normal for the growth stage of any online shopping company, there are ways in which costs can be reduced so that the growth of the business to an economically viable stage is as cost effective as possible. While saving money is important, in order to increase the customer density to a profitable level, customer service has to be of its best. The best way to attract new customers is to ensure that the current customers are 100% satisfied. (Marius Janson, 2007)

Therefore,

The focus of this project is to reduce cost as far as possible while at the same time improve customer service to ensure the customer density grows at a steady rate.

5.2 *How the Pick n Pay online shopping Model will be improved*

There are a number of problems within the process that need to be addresses and changes. In this section, the problems with the current model, mentioned previously, are address. A plan on how to solve them is established and then using various methods solutions are found.

5.2.1 **Website**

While experimenting with the website and trying to register with two different physical addresses, it was found that there is a fault with the area selection. As the website stands, customers in any area can order from online shopping, no matter where they are located. (Cotterell, 2011) When a Cape Town address was entered into the website, a message was returned that stated that online shopping does not cover this area. The location of customers on the website is controlled by e-logics and it has not been updated so new addresses are not recognised by the site. (Cotterell, 2011) This means that any customer living in a new area wanting to use the online shopping service will be turned away and told the service does not cover their area. The website has to be upgraded, firstly to identify all areas and constantly upgraded with new areas as well as eliminate areas that will not be serviced as they are too far from online shopping stores (The areas covered are further discussed in Section 5.2.4- Delivery methods).



When a customer logs on to place an order, the catalogue of the specific store their order will come from appears. However, the website only shows the items that the store offers and not the availability. The website needs to be upgraded so that when an item is out of stock, it appears as unavailable on the website. Also, if a customer orders a number of a specific item and the store does not have that many in stock, it should inform them of the maximum number they are able to order. The stock stake of each item does not need to be shown to the customer but if the item is not available it needs to be indicated. This is easier to implement at franchise stores as their stock take is generally a lot more accurate than at corporate stores. In the survey sent to franchise owners (Appendix D), they were asked to indicate the accuracy of the stock take in their store. The average of the values provided was **...(average stock take accuracy)**. In order to implement this application a link between m-web, the website providers and the Pick n Pay stock take on the SAP system needs to be created. The easiest way to do this is to have a daily stock take for the store and conduct a cross check between the stock take on the m-web system for the website with the updated stock take from the store each day. (Clayton, 2011) This will not be 100 percent accurate when orders are placed as items are constantly being sold in store and the website is only updated once a day but it will drastically reduce the number of unavailable items ordered.

There are two reasons for upgrading the website to this point. The reasons to update the website to show available items in the store are:

- When the pickers are on the floor, a lot of time is wasted looking for items that are out of stock. By only placing orders of items that are in stock, this will be reduced greatly.
- Staff are frustrated with their jobs as they constantly look for items that are not available.
- Constantly calling customers to inform them of items that are not in stock is not very good customer service. Online shopping's biggest selling point is that it is convenient. When customers are constantly being bothered and disappointed with not getting the items they ordered, the service is no longer convenient and customers will return to the old method of doing their own shopping.

5.2.2 Store Selection for online shopping:

The stores used for picking the ordered products need to be reconsidered. Originally, stores were selected according to operational condition and where it would be easiest to



set up the online shopping facilities. Distances to customers from these stores were not analysed in depth and in most cases no limit is put on the distance they are willing to travel to a customer even though the delivery cost is a set rate regardless of where customers are situated. A decision on whether to use corporate stores, hypermarkets or franchise stores also needs to be made. Hypermarket offers a wider range of products and offers a lot of operational space while corporate and franchise stores offer less but keep the system more simple. Franchise stores are widely spread and privately owned meaning a reduction in costs for the Pick n Pay as franchise owners will cover costs, shorter travelling distances but less control by top management.

From the literature study undertaken it is clear that for a company starting up an online shopping service it is best to run the service from stores and not a distribution centre. The main reason for this is the high set up costs of a distribution centre and while the customer density is small, the expense is not worthwhile. When customers are few and far between, spending large amounts of money on the construction of a central distribution centre and having to travel far distances to individual customers, the company is unable to survive. A distribution centre may be considered in the future when the company has grown large enough that there are many orders from the same area for trucks to travel to and the costs of the set up can be justified.

We therefore learn from the mistakes of other companies and work from stores, a full analysis of the use of distribution centres has not been completed as research has proven that this method is not a realistic one and has failed continuously in the past.

There are two main analyses that will be completed to decide on the stores that should be used. They are whether hypermarkets, corporate supermarkets or franchise stores should be used and which exact stores to use for online shopping.

5.2.2.1 Hypermarket vs. Supermarket Vs Franchise Stores

5.2.2.1.1 The Problem

At Pick n Pay they currently use the Kenilworth corporate store and Brackenfell hypermarket for online shopping in the Cape Town area. Transferring the service to hypermarket stores only and incorporating all products offered at these stores is the current plan as the catalogue at a Hypermarket is a lot larger and consists of many non-food products such as gardening products, clothing, electrical appliances and sporting and camping equipment which supermarkets cannot offer. This could attract more



customers but with an inefficient current system, it could lead to more complications and higher cost.

The following needs to be investigated in order to make a decision of which stores should be used:

- The distance from different store types to the current and prospective customers needs to be calculated.
- Analysis of the cost and functionality of setting up and running the business from the different types of stores
- The different catalogues offered by different types of stores and what will be most beneficial with regards to customer demand and complication of the service offered.
- Operational conditions at each store type. i.e. space available
- Cleanliness and standard of store
- Store management and efficiency levels of the different types of stores
- The profit that will be made by the Pick n Pay company when different store types are used
- The control that top online shopping management at Pick n Pay will have over online shopping activity in each of the types of stores.
- The level of service that each store type will offer to customers.

Analysis to be completed in order to make a decision:

Analytical hierarchy is used to weigh up the objectives and make a decision of which type of store would be best to use. The following steps were used in order to fulfil the analysis:

- All the objectives are identified.
 - The possible solutions are identified.
 - The objectives are weighed against each other in terms of importance and consistence of the weights is checked
 - Each objective is investigated for each possible solution and the solutions are compared according to how well they satisfy the objectives.
 - The final steps of the analytical hierarchy process are then completed and a final result and solution is found.
-



5.2.2.1.2 The Solution:

From our research we have seen that all companies offering online shopping start out making a loss until the mindset of the target market towards shopping online is changed and hence the customer density of the company increases. In America and Europe they have achieved this change in mindset and companies that started out by making a loss are now making millions from their online shopping services. In South Africa the transformation is still in progress and it is an uphill battle to convert the target market to this form of convenience. This means that customers are few and far between, high travelling costs to scattered customers and unjustified running and set up costs are still being fulfilled. The main objective in these initial stages is to reduce costs as far as possible and offer the best service possible to ensure that no current customers are lost to competitors or from the idea of online shopping. The current customers are the link to new customers so keeping them happy is essential for the success of this business. Making a profit at this stage is not the aim, the aim is to spend as little as possible and grow the active customer density as much as possible.

In order to have the best start up plan for this company, the system needs to be remodelled and it needs to be decided whether franchise, corporate grocers or corporate hypermarkets should be used for this service.

5.2.2.1.3 Identifying and analyzing of objectives

In this section each of the six objectives are discussed and analysed in terms of franchise stores, corporate stores and hypermarkets.

1. Good physical location in relation to customers

The map in Figure 12- Map of the Franchise Stores in the Cape Town area Figure 12 shows the position of franchise stores within the Cape Town area. Because, with the use of franchise stores, costs are spread between store owners and don't affect the Pick n Pay as a company very much, all the stores that meet the requirements and are interested in offering the online service can be used for online shopping. This means that small areas can be covered by each store and short travelling distances will result.

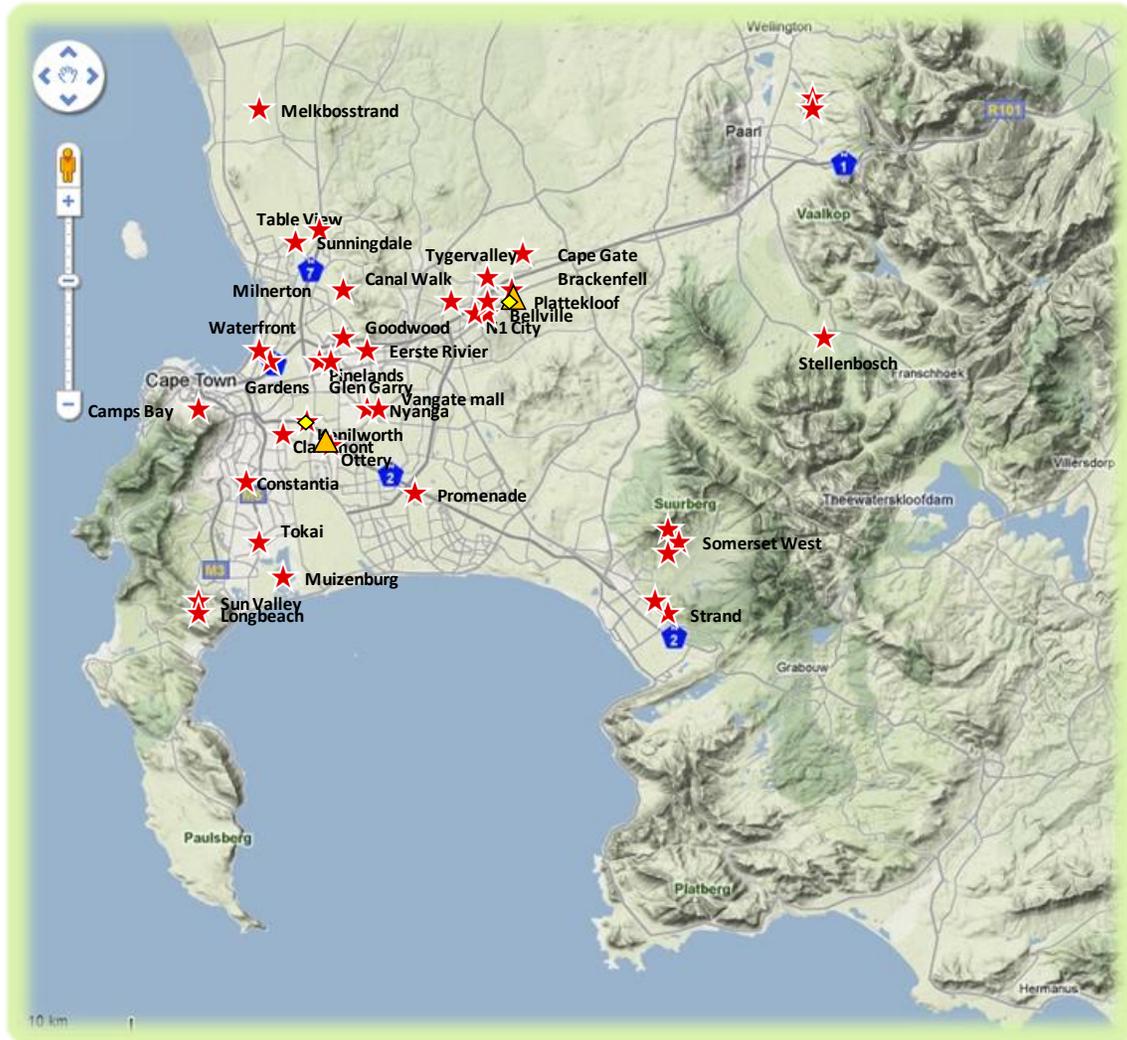


Figure 12- Map of the Franchise Stores in the Cape Town area

The map in Figure 13 shows the location of all corporate stores. In the case of corporate stores not all stores can be used for online shopping for a number of reasons including operational factors and setup and running costs so specific stores have to be selected. This means that the stores used have to have the operational ability to service a lot of customers and ideally be close to the target market. The current stores used are the Brackenfell Hypermarket and Kenilworth Supermarket which are indicated by yellow triangles. The two Hypermarkets in the Cape Town area are in Brackenfell and Ottery and are indicated by orange triangles. From this it can be seen that with the use of Corporate stores or Hypermarkets rather far travelling distances will have to be travelled to cover the Cape Town area or alternatively more stores will have to be used which will



mean more set up, staffing and transportation costs which is not viable at this point of the business.

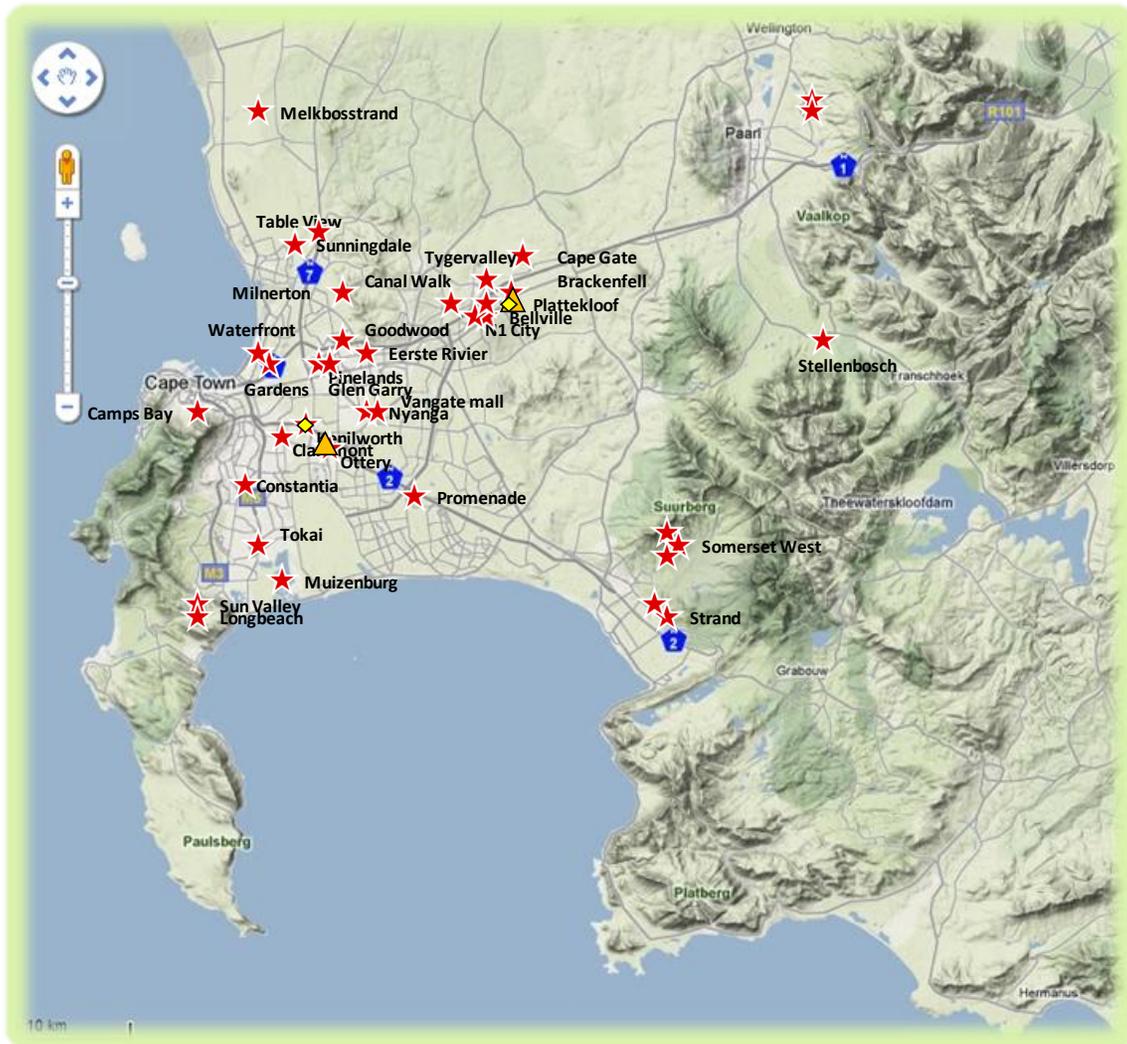


Figure 13- Map of the Corporate Stores in the Cape Town area

2. Minimize setup costs and monthly costs for Pick n Pay

The set up costs of stores for online shopping are one of the biggest costs to overcome. With the main object of this project being to reduce costs and increase the level of customer service, being able to eliminate or reduce these costs would be a great advantage.



Note: Due to confidentiality reasons, the values used in this project are not the actual values of salaries and costs but all values used are all relative a percentage of the actual amounts and therefore the total percent of savings calculated are accurate.

In Appendix A the staffing costs for corporate management and in store staff as well as set-up costs are shown. The salary for the head of Online Shopping is an estimate as this value could not be provided and the cost of a new PC was researched and an average estimate used.

From the information compiled in Appendix A it can be observed that if franchise stores were used instead of corporate stores, the set up costs would no longer be the responsibility of the Pick n Pay company but rather the individual store owners. Store owners are happy to make this investment as their turnover of grocery sales will increase immensely if their online shopping is a success. (Saayman, 2011) The total costs of running online shopping for Pick n Pay will therefore be reduced. The only costs that will be the responsibility of Pick n Pay will be those of the management staff. These costs as well as the costs no longer being covered by Pick n Pay are shown in Appendix A. With the use of franchise stores, the costs covered by Pick n Pay are reduced by 98.7%.

Staffing costs are high at corporate stores as online shopping is run completely separately to the rest of the store and therefore dedicated online shopping staff has to be hired to run the service. The situation is the same in Hypermarkets.

In franchise store, in store staff can be used to complete online shopping tasks as well as their regular tasks. This means that new staff members only have to be hired as they are needed by growing demands of the service.

3. The right catalogue at store (variety of products to choose from)

As far as catalogues are concerned, Hypermarkets offer the widest range of products. They have more size variation of each product, all the brands and have departments apart from general groceries and can therefore offer customers a wider variety of products.

Franchise and Corporate stores all have different catalogues depending on the location of the store and its particular target market but none of them offer a range of products as wide as the hypermarkets.



4. Operations conditions

The conditions at the store are very important. It is essential that there is an area big enough to operate the online shopping process as well as a loading area for online shopping vehicles to be loaded.

Hypermarkets offer the most space for the online operations to take place. With respect to franchise and corporate stores, each store will differ. Some will have space sufficient to accommodate the online shopping service and some will not be considered at all due to a lack of space.

5. Cleanliness and standard of store

Customers who utilize the online shopping service generally expect their products to come from stores similar to the ones they would shop at. The majority of these customers shop at the more up market Pick n Pay stores. The stores need to be clean and offer fresh products.

With corporate and hypermarket stores being used this is easier to ensure as stores will be chosen with this in mind and the products sold are controlled by Pick n Pay. With respect to Franchise stores it is more difficult to control this as the owner of the store is responsible for the standard of the fresh produce offered. However, the success of franchise stores is reliant on the standard of the products they offer. Franchise owners want to make a success of their stores and therefore, for the most part, the standard of products will be very good. Also, if particular franchise stores are not up to standard, they do not have to be included in the online shopping process. Senior Pick n Pay management can decide which stores they want to use for this service.

6. Good store management/efficiency

It is difficult to generalize with regard to management at different types of stores and investigating this is not easy as interviewing someone could result in an opinion of a person that is not necessarily accurate. From observations made in store, the management at the Hypermarket seemed very good as well as at the franchise stores as for the most part the owner is at the store. At corporate store (this does not include all the Cape Town stores) management tends to be less enthusiastic and committed than at the franchise stores and hypermarket. However, in the current model where online shopping is run from corporate stores, separate online shopping management is hired.



The online shopping manager at the Kenilworth store is extremely enthusiastic, helpful and friendly.

7. Profit made by Pick n Pay for sale of goods

Although the model focuses on reducing cost and improving customer service, profit still plays a role. If franchise stores run online shopping, they will make the money from the online sales and not Pick n Pay. If the online shopping is run from hypermarkets or corporate supermarkets, the Pick n Pay Company will benefit from all sales.

8. Top management of online shopping should have good control over the way their online shopping is run.

Top online shopping management should have control over the way in which their department is run and the service offered to customers. Regardless of whether franchise or corporate stores are used for the picking, Pick n Pay's reputation is still at stake and the service represents the company. As the system stands, using corporate store, there are only 13 stores country wide used for online shopping. Each store has an online shopping store manager and assistant manager and top management can easily control activity as the store manager's work for them. This would not be the case if franchise stores were to be used as the owners of the stores do not work for the online shopping management. If franchise stores were to be used, strict rules and regulations regarding how the process is run would have to be put in place to ensure consistency country wide and control of online shopping management.

9. High customer service level (correct stock take info, on time deliveries)

With the new website put in place, using the SAP system to indicate if items are in stock or not will improve the customer service as there will be less out of stock items ordered that with the current system where only which items the store stocks and not the availability is shown. However, if the stock take on the SAP system is not accurate, the new website will be useless as it will indicate all the wrong availability quantities.

Corporate stores tend to have less accurate stock take as the items in the store belong to Pick n Pay regardless of whether they are in the distribution centre or the store. As a result of this, if more or less items than were ordered arrive from the distribution centre, the store will take them and be over stocked if need be.



Franchise stores are run differently as they are not owned by the Pick n Pay company. In the receiving bay items are checked thoroughly for defects and quantity as the owner of the store is paying for each of those items. The stock take is therefore extremely accurate and the quantities in store shown on the SAP system will be very close to the exact in store stock levels. The average accuracy of stock take at franchise stores was indicated by franchise owners to (bestill to be completed) The results of each franchise stores stock take is shown (In Appendix xxx..still to be completed)

There will always be the factor of items being bought in store before items that were available and ordered online are picked. In this case the customer will have to be notified and possibly unhappy but it is very difficult to avoid this.

5.2.2.1.4 Decision Making using Analytical Hierarchy

Analytical Hierarchy is now used to decide which store type would best fulfil these objectives. The above discussed objectives have been condensed into six main objectives for use in the Analytical Hierarchy.

- What is analytical Hierarchy?

Analytical Hierarchy Process (AHP) is an approach to decision making that involves structuring multiple choice criteria into a hierarchy, assessing the relative importance of these criteria, comparing alternatives for each criterion, and determining an overall ranking of the alternatives.

- Why would you use analytical hierarchy?

The reason for using this method is that it helps capture both subjective and objective evaluation measures by providing a useful mechanism to check the consistency of the evaluation measures and thus reduces bias in decision making. AHP minimize the probability of common pitfalls of decision making process, such as lack of focus, planning, participation or ownership

- How is analytical hierarchy used?

In appendix 2 the data used and calculations are shown as to how the results were obtained.

Below the steps of the process is explained and results are shown: (Winston, 2004)



1. State the objectives:

There were originally nine objectives discussed earlier in this section. They have been condensed to six main objectives for use in analytical hierarchy. The six main objectives are:

1. Good physical location with regards to position of customers
2. Minimize set up and running costs
3. Good customer service (management and efficiency) from store and catalogue accuracy
4. Operational Conditions must be realistic for online shopping (space and receiving bay)
5. Maximize profit made by the Pick n Pay company
6. Maximize the control that the Online shopping top management has over operations at stores

2. State the possible solution:

The possible solutions are the use of:

1. Franchise Stores
2. Corporate Supermarkets
3. Hypermarkets

3. Obtain weight for each objectives:

Suppose there are n objectives, an $n \times n$ matrix is created. In this case it is a 6×6 matrix. This is known as a pair wise comparison matrix. The entry in column i and row j shows how much more important objective i is than j . (Winston, 2004)

The scores are then converted to percentages and overall level of importance are calculated for each objective. The final weights of each objective are shown in Table 2



Final Objective score	
1	0.059487
2	0.340828
3	0.221933
4	0.196423
5	0.035313
6	0.146016

Table 2- Final Weights of importance of each objective

4. Check for consistency:

The weights are now checked for consistency of the decisions made.

Check for consistency	1	2	3	4	5	6	
1	1.00	0.17	0.20	0.20	3.00	0.33	0.059487
2	6.00	1.00	2.00	2.00	7.00	2.00	0.340828
3	5.00	0.50	1.00	1.00	5.00	2.00	0.221933
4	5.00	0.50	1.00	1.00	5.00	1.00	0.196423
5	0.33	0.13	0.20	0.20	1.00	0.20	0.035313
6	3.00	0.50	0.50	0.50	5.00	1.00	0.146016
$1/n * \sum(AwT/wT)$	6.049796						
CI=	0.009959						
CI/RI	0.008032	<.1	therefore satisfactory decision making				

Figure 14- Check for consistency for objective weights

5. Find the Score of an alternative (possible solution) for an objective:

The observations and analysis of the nine original objectives made in section 5.2.2.1.1 will be used in deciding how well each possible solution satisfies the objectives.

Each possible solution is weighed against the other possible solutions according to how well it fulfils each individual objective.

These comparisons are then turned into percentages and over all scores or satisfaction of the objective are calculated for each objective. The comparison of



level of satisfaction of objective one for the possible solutions is shown in Table 3 as an example. All solutions are shown in Appendix B.

A			Anorm			wT		
Objective 1								
	Hyper	Franchise	Corporate		Hyper	Franchise	Corporate	
Hyper	1.00	0.14	1.00	Hyper	0.11	0.11	0.11	0.11111
Franchise	7.00	1.00	7.00	Franchise	0.78	0.78	0.78	0.77778
Corporate	1.00	0.14	1.00	Corporate	0.11	0.11	0.11	0.11111

Table 3- Each possible solutions compared satisfaction of objective 1

6. The final decision making

The final decision of which alternative should be used is now made. This is done by multiplying the score of each objective (level of importance) by the score achieved by the possible solution in relation to its ability to fulfil this objective. (Winston, 2004) The final scores for each store type are shown in Figure 15

Hyper	0.319
Franchise	0.47207
Corporate	0.20893

Figure 15- Final Results for each store

The final result from this analysis was that franchise stores should be used to run online shopping.

7. Conclusion:

Although more money will be made by the Pick n Pay company if orders come from the corporate stores, franchise stores are privately owned and therefore it is assumed that the owners would be more passionate about making the service work as it could largely increase their turnover.

From the research undertaken on other online shopping companies, it was seen that all of them started out making a loss for the first few years of their business being open, until the client base had grown enough to make the service worthwhile. Because Pick n Pay is still in this development stage, the new model



will be aimed at keeping the costs down as far as possible, while still providing a great service to increase the customer base and make as little of a loss as possible.

This makes the use of franchise stores very appealing as many of the costs will be covered by the franchise owners and they will offer a good service to customers which would help in growing the business with a good reputation. Another reason for using franchise stores is that their data source is very accurate. Corporate stores tend to allow their stock data to become inaccurate because they accept items from the distribution centre that were not actually ordered because at the end of the day whether items are in a corporate store or in the distribution centre, they are still owned and will be sold by Pick n Pay. The franchise owners are very particular when accepting their orders as any orders that are short of items will be a loss to them and any items that are extra will result in a loss to Pick n Pay. This means that their stock taking is extremely accurate. With the new set up of the website this will be an advantage with online shopping as the availability shown on the website when placing an order will be taken from SAP and is the stock list of the store. If this list is inaccurate and indicates that items are in stock when they aren't, it causes a problem when the order is picked and the customer has to be called for the order to be altered. This wastes time and also does not look good for the company as it is irritating to customers making it an inefficient service.

The big concern now is whether Pick n Pay will ever make a profit from this service if all the business is given to franchise stores. Franchise stores are great for the development stage of this service as they are able to keep costs low and increase their individual store revenues by a large amount each month. Having said this, once the mindset towards shopping online in South Africa changes and the service grows big enough for Pick n Pay to extend their service and want to run it from corporate stores, it will not be fair to take the service away from franchise stores. This is not a problem as franchise stores have a maximum capacity and can only service a certain amount of customers. Franchise owners will be happy to have increased their revenue by a large amount and once the capacity of the service exceeds their ability, the excess can be fulfilled by corporate stores. The portion of the market that will be fulfilled by franchise stores will be so small in comparison to the possible market that could be drawn to this



service. Therefore, the small number of customers that remain with franchise stores will not have a large effect on the Pick n Pay company's turnover once the service has grown to its potential. If desired by Pick n Pay, they can contractually limit the number of customers each franchise store can service once they decide to service customers from corporate stores. By doing this they can decide how many customers they are willing to give to franchise stores in order to grow the business. Franchise stores will be happy with any increase in revenue and as the service can be run by their in store staff, the extra business will not cost the franchise owners much at all. Pick n Pay can also offer items from their hypermarket such as clothing, gardening items, electronic devices, etc which are not stocked in franchise store. The business will not be lost to franchise stores and the room for growth once the service is established beyond the abilities of franchise stores is enormous.

Online Shopping at Pick n Pay should be run from franchise stores. The remainder of this project will be based on online shopping run from franchise stores.



5.2.2.2 Selection of Specific Stores

5.2.2.2.1 The Problem:

Now that it has been decided that franchise stores will originally be used for online shopping in the new model, we need to look at which specific stores should be used for the service. In order for a store to be used, it has to meet certain standards. The following will be investigated in order to decide on stores to use:

- The accuracy of the stores stock take
- The security process used
- The interest of the franchise owner in offering online shopping
- Whether the franchise store already offers a home shopping service.
- Whether the store owner will be willing to cover the setup and staffing costs for the service
- The available space at the store to set up the online shopping service
- The size of the stores receiving bay
- Whether the store owner would be prepared to provide their own transport for orders or if they would be willing to use one of the options proposed to them
- How many people they would be willing to hire in order to offer this service from their store.
- Location of stores with regard to target market
- Make a decision between removing the service from areas that are too far from the stores chosen and have a low customer density and taking the risk of upsetting customers and possibly losing their business forever or adding the service to another store in their area to keep the customer happy. (e.g. The George store services Knysna and Brenton-on-sea for the standard rate of R60 per delivery. Knysna is 60km from George and Brenton-on-sea is 70km away. Therefore, 140km is travelled to make one delivery to Brenton-on-sea)

5.2.2.2.2 The Solution

**Section not complete*

This section has been set out in an excel sheet with the feedback from each franchise owner. The results have not yet been added to the final report as I am still waiting on feedback from some store owners. Once all responses have been received, the analysis will be completed. The purpose of this section is to identify which franchise owners want



to be a part of online shopping and if their store set up allows them to do this. The questionnaire can be seen in appendix 3 and answers all the objectives of this section except for the last two. The second last objective will be answered using a map to locate the franchise stores to be used as well as distances travelled from each of those stores in order to cover the main customer area. Most of these distances have already been worked out. The last objective can be completed once it has been established which stores will be used.

From the owners questionnaires that have been received it can be seen that most franchise owners are willing to be a part of online shopping and have sufficient space to do so.



5.2.3 Picking Method

Picking methods need to be completely redesigned as in a recent study the staff picked at a rate of 11 SKU's per hour where as in a test their managers were able to do the same job at a rate of 78 SKU's per hour. This study was not carried out at the Kenilworth Pick n Pay where the processes are more efficient. There are many problems faced here, according to management a big problem is the labour laws and not being able to control the rate at which pickers work. Many solution have been discussed but up till now there is not one that can be enforces and will be successful. Initially it was thought that the pickers performance was the main problem but after analysis it was found that their work ethic poor merely because not much is expected of them. The picking process is a very important part of the system as it affects the efficiency of delivery times, customer satisfaction and costs. Most of the deliveries that arrive late to the customer door are late because the orders were not picked and rung up on time. This also causes Pick n Pay to have to offer large delivery slots, which is less convenient for customers, as they cannot guarantee an order to be ready in a short space of time. The labour costs are also higher as more pickers are hired to ensure that all orders are picked each day.

5.2.3.1 The Problem

The picking methods currently used are very inefficient and have vast room for improvement. This is a difficult problem to fix as the labour laws restrict management from enforcing a standard rate at which pickers work. Much brainstorming has already been done in this regards and a solution was not found. With a full analysis of the current system, methods in which to improve the system will hopefully result. The best approach is to set standards and make the picking process as simple as possible to ensure picking speed is at its maximum. The following steps will be taken:

- Analyze the current picking methods being used
 - A time study will be carried out for the picking process
 - Follow picker and record each activity and identify activities that can be improved or where time is wasted
 - Look at the difference in methods and variable for picking fresh and dry products
 - Investigate how much time is wasted due to the SAP data being incorrect and as a result orders being placed for items that are



actually not in stock. In this case the picker has to phone the client before returning to the floor to continue picking the order

- Analyze the affect of the time of day the orders are picked i.e. how the number of customers in the store affect the picking process.
 - possibility of early morning picking
 1. Will it be beneficial
 2. Is it realistic
 3. Will it result in more orders being ready on time and possibly allowing the order slots to be decreased?
- Investigate the use of hand held scanners and whether they will be worthwhile introducing at this point of the business.
- Analyze the check out method
 - How long it takes
 - Is the extra checkout counter necessary instead of using the in store checkout counters?
 - For what portion of time is the online shopping checkout clerk idle
- Look at the layout of the online shopping room and indicate where the process could be improved or simplified in this regard
- Decide on possible alternative solutions
 - A method to increase the picking rate is needed. As it has already been decided that picking will take place at stores, a completely new method is not possible but improvements to the current method most definitely is.
 - A cheaper was of setting up the online shopping facility and picking methods could result in it becoming more viable to increase the number of stores used for online shopping.

5.2.3.2 The Solution

At Pick n Pay orders are split into dry products and fresh produce and picked separately. The afternoon before the order is due the dry products are picked and left in a trolley in the online shopping room and the next morning (the day that the order is due) the fresh products are picked. In Figure 16 it is shown which part of the picking process is being considered. A full size version of the flow chart in figure 16 is available in Appendix L.



A picker takes a new order and marks off all the fresh produce. They then move to the floor and pick the dry products of the next day's order. In the afternoon, when most of the dry products are picked, the store is generally fuller and this causes a delay in the picking process as trying to work around in-store customers can sometime be a problem.

Time studies at the Kenilworth store were completed to study various aspects of the online shopping process. They were carried out over three days, 4 different pickers took part in the time study and different times of the day and different types of picks were recorded. It must be noted that time studies were conducted to identify problems with the process

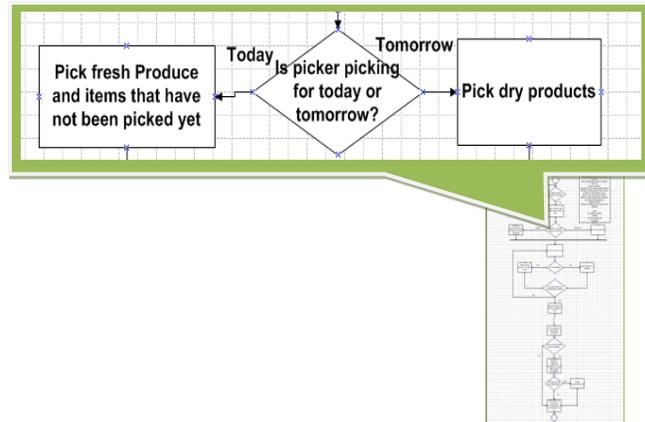


Figure 16- Picking of fresh and dry products

and not the performance of the pickers. Also, Kenilworth is considered the most efficient online store and therefore performance results are better than in other stores. Collected data was used to analyse different aspects of the picking method and circumstances.

5.2.3.2.1 Activities noted during time study that need to be addressed or improved

5.2.3.2.1.1 Pickers Idle

Pickers are given a 15 minute coffee break at 10am. In the mornings spent at the store these coffee breaks extended to around 45 minutes. The morning is a crucial time for picking as the store is generally emptier than in the afternoons so picking can happen at a faster pace and deadlines for orders are quickly approaching.

When the pickers work in the mornings they are very productive and very seldom break or waste time between picks. In the afternoon this is not always the case. Pickers become tired, they get annoyed with the full store and tend to spend more time idle in the online shopping office either because they don't feel like working or because the demand is not great enough with the number of pickers present for them to be under pressure to get the work done.



It is clear in the morning when the pressure is on to get the fresh produce picked for that day's orders that pickers are capable and willing to work productively but because of the lack of urgency in the afternoons they tend to not be as productive. This shows that there are too many pickers hired to complete the job and costs could be cut in this department. With the new model where orders will be picked by current in store staff, staff will not be idle and will pick the orders as quickly as possible in order for them to continue with their other work for the day. The owners of the store will also be present to ensure staff are busy at all times and therefore a good work ethic of staff will be maintained.

5.2.3.2.1.2 Items out of Stock

Out of stock	
1	25.00%
2	7.14%
3	8.33%
4	8.70%
5	21.43%
6	30.00%
7	38.46%
8	11.11%
9	10.81%
10	11.11%
11	19.23%
12	22.58%
Average	17.83%

Table 4- Out of Stock values for orders in time study

From the time studies conducted, on average 18% of SKU's in each order were out of stock. The out of stock percentages for each order are shown in Table 4

Other items were available in the store room but had not been packed onto the shelves by in-store staff. This caused pickers to become frustrated and they expressed their frustrations while picking items. It also wasted a lot of time as pickers spend extensive time looking for items which are not in stock and having to go to the store room to find items. In a franchise store, owners will ensure that items are on the shelves as they want to maximize their revenue as far as possible. Also, in franchise stores, while the service is not too large, in store staff will be picking items and therefore have the responsibility of picking orders as well and packing shelves and will therefore be more encouraged to ensure shelves are stocked at all times to make their picking responsibilities easier.

5.2.3.2.1.3 Items available not considered good enough for online shopping orders

Because there is no connection between online shopping staff and in-store staff in the current model and stores are not privately owned, different staff have different perspectives of product quality.



Many of the items that were available on the store shelves the pickers did not consider good enough to be sent to the customer and would therefore walk to the store room to collect new stock for the order.

At a franchise store this will not be necessary as the staff originally picking the orders will be the same staff as the staff packing the shelves. They will therefore ensure that items in the store and items being sent to customers are of the same high standard at all times. The staff will therefore visit the store rooms less frequently when completing an order. Franchise store owners would generally not allow inadequate products to be on their shelves or sold to any customers, online or in-store.

5.2.3.2.2 The difference between picking fresh produce and dry products

When analyzing the time studies conducted with regard to fresh and dry product picking rates, only morning picks were considered as the customer capacity in the store would be the same and would not affect the results.

Figure 17 shows the difference for fresh produce and dry products in time spent on picking items during the picking process. The last dry product order contradicts the trends and this is because it is an order for a crèche where all items were baby products.

The reasons for the picking time per SKU being so high are:

- Items were all very similar so, as with toiletries, it took quite long to find each item
 - A lot of items were out of stock so the picker spent time looking for unusual items that they were not familiar with and were not actually on the shelf
 - There were large orders for each SKU so either:
 - The picker had to pick a few of each SKU or
 - If the item was not available in the volume wanted, the picker had to pick what was available and then take time to write down how many were picked
 - There were quite a few customers in this aisle
 - There was an in store staff member packing the shelves that the picker was busy selecting items from.
-

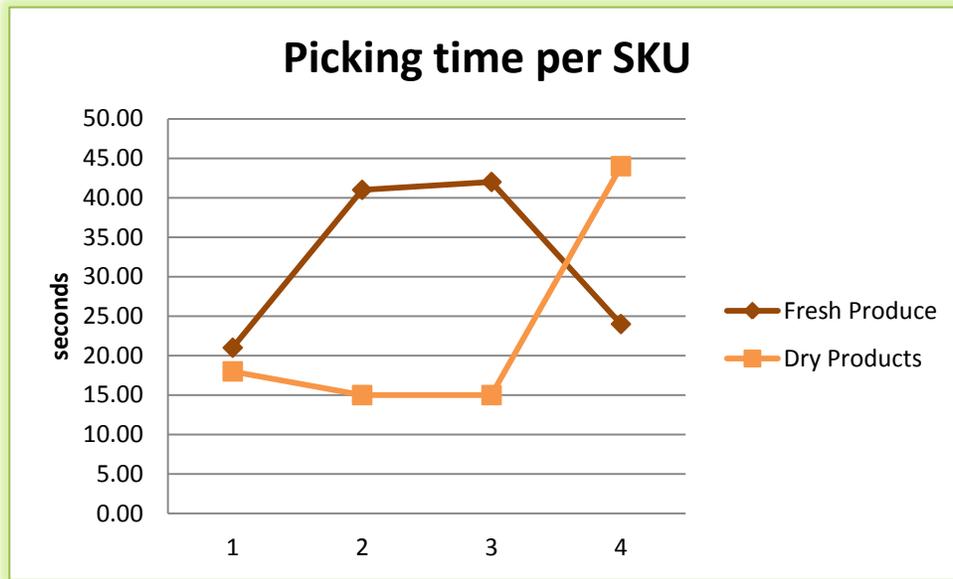


Figure 17- Picking time per SKU in Fresh and dry product orders

In Figure 18 the percents of time spent walking and in Figure 19 time spent actually looking for and picking the items is shown. The last dry order contradicts the pattern of high percent of walking and lower percent of picking as it is the crèche order. The last order of fresh produce contradicts the pattern of high picking time and low walking time as a different picker did this order to the other ones and was extremely precise about the items chosen and visited the store room a few times to collect fresh stock.

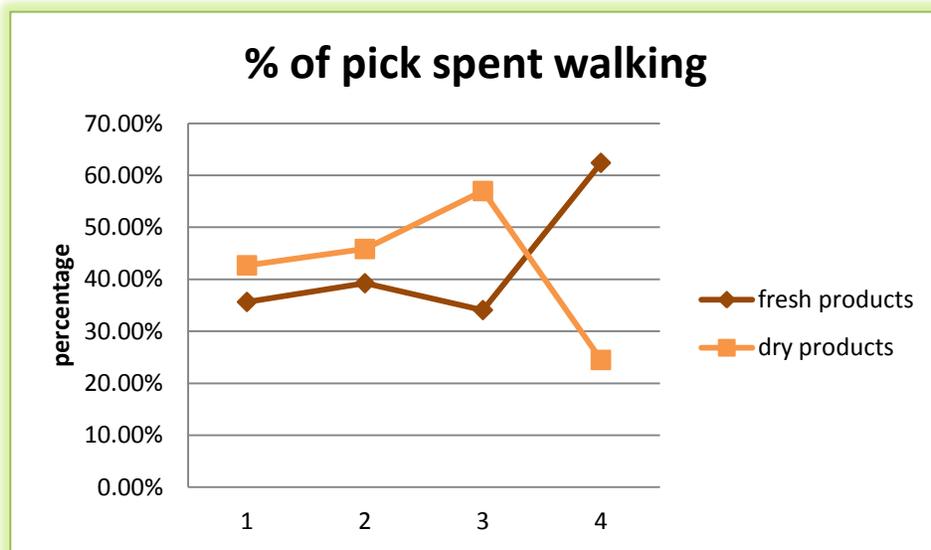


Figure 18- Percent of time spent walking while completing an order

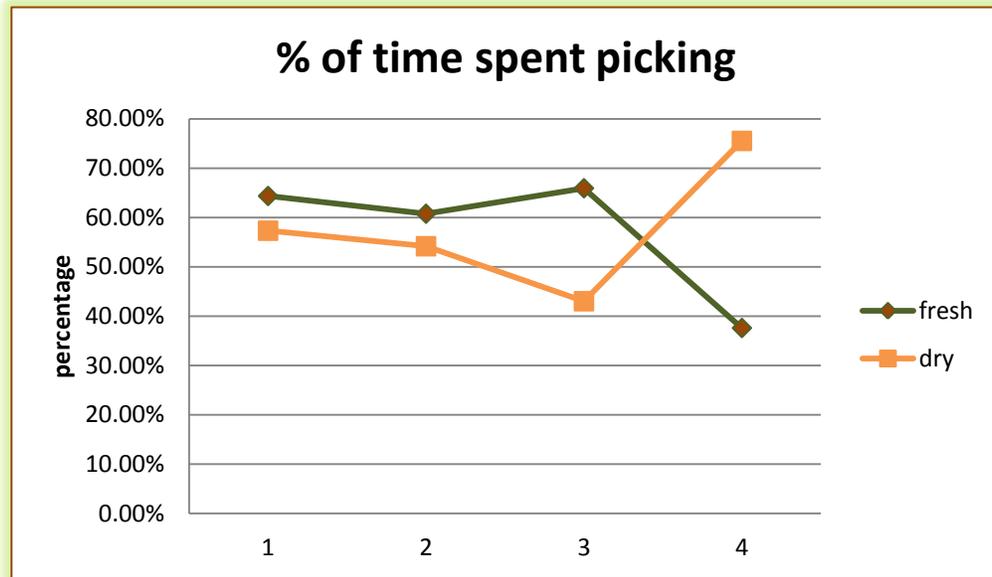


Figure 19- Percent of time spent looking for or actually picking items while completing an order

Although dry products are further distributed throughout the store and are picked when the store has more customers in it, it can be seen that pickers tend to complete their dry picks at a faster rate than fresh product picks.

Reasons for this:

- Dry products require less selection and inspection than fresh products
- Frozen and dairy products are on the opposite side of the store to the bakery, cheese, fruit and vegetables, butchery, seafood and precooked meals.
- The store room is visited more often for two reasons
 - Pickers are very specific about the quality of the items they add to an order
 - The product has not been packed onto the shelf yet
- Meat is selected very specifically and sometimes needs to be ordered from and packed by the butcher
- Some fresh products have to be weighed
- Cold meats and baked items must be collected from a counter where there may be a queue of customers.

Ways in which fresh produce picking time can be reduced:

- (As in most stores) Have all fresh produce in one area of the store



- Ensure that only fresh items are available on the shelves (this is very likely in franchise stores)
- Make sure that fresh produce is packed onto the shelves when it is delivered so that it has a longer in store shelf life

The focus of the new online shopping model is to save money and give a better service to the customers. It is more worthwhile to allow pickers to spend more time in ensuring they pick the best items than to try to speed up the process with the risk of sending below average products to the customers.

5.2.3.2.3 The effect that the time of picking has on the process

The first consideration was the time that can be saved by picking at different times of the day. The store is generally emptier in the morning than in the afternoon.

Currently at Pick n Pay all picking is done during trading hours which means pickers have to deal with shoppers getting in their way and slowing the picking process down. Hand held scanners are being considered for use in the future where pickers will scan the items as they enter the trolley and therefore the check out at the end of the picking process will be a lot quicker. This is a very useful method however it comes at a costly price. Picking before hours was considered but eventually it was decided that it would not be possible due to union laws and unhappy staff. Woolworths uses this method with their pickers arriving at work at 6am. At Pick n Pay one of the pickers arrives at work at 7:30 to start picking but this is her choice so that she can finish work early. An analysis of the data collected during the time study was conducted to determine whether it would be beneficial to pick items before hours. As this option could not be measured, a comparison between the time it takes to pick in the morning and the afternoon was completed. Only picks of dry products were considered for the comparison to keep other factors out of the comparison. Orders for offices and homes were included and this does influence the results slightly as offices orders often contain items from one or two isles where as an order for a home will contain items from all over the store.

The results are shown in Table 5 and Table 6 and they are graphed and compared in Figure 20 and Figure 21 .



Afternoon					
	office	office	home	home	home
picking time/SKU	00:00:11	00:00:12	00:00:13	00:00:10	00:00:17
walking time/SKU	00:00:23	00:00:19	00:00:27	00:00:13	00:00:19
% picking	31.82%	37.92%	33.18%	43.33%	47.13%
% walking	68.18%	62.08%	66.82%	56.67%	52.87%

Table 5- Data from dry product orders picked in the afternoon

In the afternoon the large capacity of people in the store causes the pickers to be slowed down and therefore spend more time walking to the desired location to pick items. During conduction of the time studies it was noticed that pickers often got stuck behind customers and trolleys and as they have to be polite, were unable to past customers and therefore picking of orders were a lot slower in the afternoon than in the mornings. The large capacity of customers also caused pickers to become agitated and frustrated and they appeared to be a lot happier doing their jobs in the morning.

morning				
	office	office	home	office
picking time/SKU	00:00:15	00:00:18	00:00:15	00:00:44
walking time/SKU	00:00:12	00:00:13	00:00:20	00:00:14
% picking	54.17%	57.32%	43.02%	75.52%
% walking	45.83%	42.68%	56.98%	24.48%

Table 6- Data from dry product orders picked in the morning

One of the morning picks indicates that 75.52 percent of the picking time was spent picking and a mere 24.48 percent of the time was spent walking. This agrees with the trends but is rather excessive and this is because this order was very specific. It was an order for a crèche and only baby products were ordered. The picker therefore spent most of their time in a very small space looking for and picking items. This reading is not a good indication of the impact of customers in the store as the picker did not move much although the picking process was slowed down by staff packing shelves and customers getting products in the area that the picker was busy in.

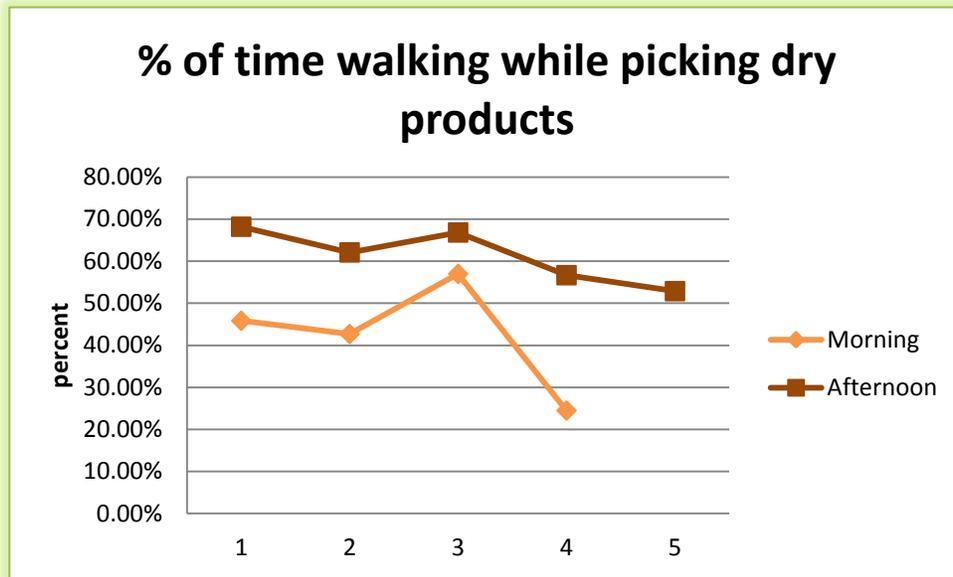


Figure 20- Comparison of the % of time spent walking while picking dry products in the morning and the afternoon

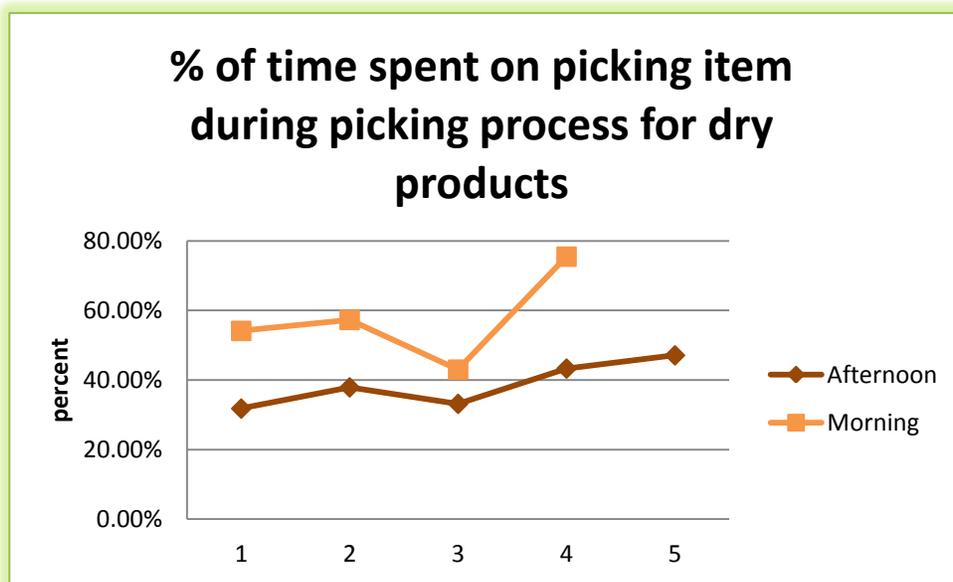


Figure 21- Comparison of the % of time spent looking for and actually picking items while picking dry products in the morning and the afternoon



To get a true estimate of the time saved by working when the store was emptier, the readings from the crèche order were left out when measuring the average times spent walking between items. In the afternoon it was calculated that it took an average of 20 to move between each SKU and in the morning it took 15 seconds to move between each SKU. This is only taking dry product picks into consideration to ensure this factor does not affect the matter on hand, affect of customer capacity.

5.2.3.2.3.1 Picking before store opens

In the time study conducted it was calculated that it takes 31 seconds to pick each item. Although this seems quicker than expected, it does not include the time of pickers being idle. It only includes the time from when the picker leaves the online shopping room to begin a pick to the time they return with a full trolley. Also keeping in mind that the Hawthorne effect took place while time studies were conducted, the total time it takes to pick orders is a lot longer than this. If orders were picked in the morning before the store opened, there would be no delay and pickers could pick items freely and efficiently. They could easily shorten the travelling time between SKU's from 15seconds (current time in morning) to an average of 10 seconds. This would result in the job being completed quicker and pickers not becoming frustrated with the traffic jams they currently have to deal with. At Woolworths 80% of picks for the day are completed between 6:30 and 8:00 am. Using franchise stores at Pick n Pay will make this option more viable and result in staff completing the picks early in order for them to continue with their other responsibilities. Pickers completing the job quicker would also result in the need for fewer staff members or alternatively shorter working hours for picking staff. Because this model is focused on reducing cost and working from a franchise store, staff will work a normal number of hours, but end work earlier. This will provide a flexible alternative to staff that would rather finish work earlier as different working shifts will be established. A proposed work schedule is shown in Table 7. The formula in table 7 will be used to determine how many early morning staff members are needed. The idea is to get as much of the picking done in the early morning as possible. In the formula we assume that picking will take place between 6:30am and 9am. We therefore work out how many items need to be picked, multiply this by our estimate of 30seconds of picking per item and by the 2.5hours between 6:30am and 9am. We also add on 10 minutes for check out of each order as the picker will be responsible for this too. 30 seconds is chosen for picking rate for two reasons, Firstly, the picking rate at Kenilworth was averaged at 31



seconds per item, although this process will be quicker, time between orders was not considered and it was observed that pickers worked faster than usual because they were being timed. The second reason is, although it is estimated from the time study results that pickers can move between SKU's at a rate of 10 seconds, there are other factors that could cause them to be slowed down. Some of the points mentioned in section 5.2.3.2.2 would apply here. This picking time can be altered once the process has been tested and a time study conducted. This unfortunately could not be completed for use in this project. The number of staff members starting work at 8am and 10am will be dependent on the number of staff members and the online shopping demand and therefore the number of staff members starting work at 6:30am

Because staff members are not solely committed to one task in franchise stores, picking can be completed in a fast and efficient manner in the early morning and the picker can then continue with other work within the store. Early morning pickers will be able to take a breakfast break at 8:30am and staff that arrive at 8am can then take over and pick the remaining orders. Once the early pickers return from their tea break they can continue with in store work.

When the 10am starting staff arrive, the 8am starting staff can take a tea break. And at 11 the 6:30am staff can take a tea break. In this way, all staff don't take breaks together and therefore there is always staff in the store. Because, at a franchise store, the staff work as a team, work can be distributed to benefit everyone and make the overall aim, making the store and online shopping processes efficient, a lot easier to achieve.

Shift	No. of staff member	Responsibility
6:30- 15:30	No of orders x (average no. of items in an order x 0.5min +10min)/(2.5x60)	Picking orders and in-store
8:00-17:00	Dependent on above	Picking and In store
10:00- 19:00	Dependent on above	In store

Table 7- Proposed work schedule

5.2.3.2.4 Viability of using hand held scanners

Handheld scanners can be extremely useful and save a lot of time as well as make the jobs of picking staff a lot easier. However, installing this system is very expensive. In



order for the scanners to be used, the network connecting them to SAP needs to be installed in the store which costs R200000 (this is not the actual value, this is the changed value for confidentiality reasons- The real value is an extremely large amount in comparison to the effect the installation will have on the process). With our model being focused on increasing customer satisfaction and decreasing costs, it is decided that handhelds are not viable to implement at this point in the company growth for the following reasons:

- It does not increase customer service
- It counteracts our vision on reducing costs as far as possible
- Franchise stores are going to take over online shopping for the time being and owners will not be prepared to invest this kind of money for the revenue they will receive in return (keeping in mind that franchise stores will reach a maximum capacity of orders and corporate store/a distribution centre will then be implemented)
- Picking will take place in the morning when the store is empty, pickers are able to look at the paper with the order on properly and tills will be free for ringing up of orders.
- Orders are going to be printed in the order of the isles in the store and therefore pickers will not have to jump around the order form to find the items they have to collect from the isle they are in.

5.2.3.2.5 What is expected of picking staff

Picking staff are currently expected to pick at a pace of one item every minute. From the time studies it is evident that pickers are able to work faster than this. The average picking time was recorded to be 31 seconds per item. This value took all activities during the picking process into account including picking, walking, weighing fresh produce, calling the customer and replacing items that are out of stock. Having said this, with some pickers, the Hawthorne effect definitely took place.

Before the time study was completed it was expected that the results would be consistent and clear conclusions would be able to be drawn. Although patterns did appear and conclusions could be drawn, there were factors that caused some results to contradict the trend that were not considered before the time study was conducted. It is now clear that although a pattern can be seen and the time study results were helpful in



noticing trends, the majority of the problems with the system were found while conducting the time study rather than by looking at the results.

5.2.3.2.6 Check out methods:

In the current model, the online shopping room consists of two check out tills. Only one of which is working. When asked why the other till is not used the in store manager said the second till is mainly for when the till being used breaks, it is a back up. (Jackson, 2011)

The room they are working out of is 10x5 meters and the available space is extremely limited. In the current model, one till should be removed to make more space available and the in store tills used as a backup.

However, to reduce cost and save space in the space restricted franchise stores, in the new model items will be stored in the dedicated online shopping area but checkout will take place at the in store tills. A system is already in place that distinguishes check outs from being online shopping orders or in store customer orders at the corporate stores. (Clayton, 2011) This application can be applied in the franchise stores so that record of sales can be monitored by franchise owners and online shopping management.

5.2.3.2.7 The layout of the Online Shopping Room.

The measurements and layout of the current online shopping room at the Kenilworth Store is shown in Appendix N. The position of trolleys, delivery bins and orders are shown in Appendix O. (This was the exact layout of the room during a visit to the store) From Appendix O it can be seen that the current method is extremely disorganised and inefficient for the following reasons:

- The space available is not utilised.
 - Orders are difficult to find as they are all stacked on top on one another and scattered around the room
 - Trolleys with orders that need to be rung up are placed around the edge of the room and often make it difficult for the staff to move around
 - Order forms are placed in the trolleys with the items to be rung up therefore:
 - Specific orders are difficult to find as forms must be checked for specific orders
 - Order forms could easily get lost and the customer of the order unknown
-



-
- A lot of time is wasted checking order forms in trolleys around the room to find the one they are looking for.
 - Two check out tills are available but only one is used
 - The shelves are occupied by old magazines which have been there for at least 9 months. They have no use and are not online shopping property.
 - Boxes are lying around and taking up space.

Although with the new model online shopping will take place at franchise stores, in order to show the improvements that can be made, the room was redesigned and the results are shown in Appendix P.

- The unused till is removed and the other till is placed against a wall as the checkout clerk unpacks the trolley next to him as he rings up the items.
 - Trolleys containing orders needing to be rung up are neatly stores between the door to the shop and the checkout counter for the following reasons
 - When they are brought in to the room they will not interfere with outgoing orders. On the other side of the room.
 - They are low so dividing walls can be low in order for management, checkout clerks and packing to staff to be able to see the rest of the room.
 - The walls will contain hooks above each trolley on which white boards will hang with the customer name and delivery slot that the order will be delivered in.
 - Full bins, ready for delivery, will be stored near to the exit door as shown in Appendix P for the following reasons:
 - On leaving the store they will not be in the way of incoming trolleys.
 - They can be stacked against the walls provided up to 4 bins on top of each other.
 - Stickers will be placed in the visible side of the bin indicating the customer's name, what delivery slot it must be in and the truck allocated to delivering this order.
 - Empty Bins are stored inside each other next to the manager's desk and near the check out till for easy access by packers.
 - The manager's desk will remain in the same position as it currently is so that the manager can see the entire room at all times.
-



At the franchise stores, items will be picked and packed into the delivery bins and then stored in the online shopping room. The layout of the online shopping room is shown in Appendix Q.

- There are 25 spaces for delivery bins to be stored; this means that there can be up to 100 bins stored in the storage room at any one time (if 4 bins are stored on top of each other).
- A freezer and fridge will be available for storage of fresh produce until orders leave the store. Cold boxes are also available but are rather expensive. They will be used for orders leaving the store to be delivered.

5.2.4 Delivery method

A decision needs to be made about what form of transport will be used to deliver orders to customers. Because orders are being divided between franchise stores and therefore less orders will be delivered, the cost of hiring trucks will become even more uneconomical than it is now. Franchise stores will reach a capacity of the customers they are able to service and therefore large investments are not viable as they are for corporate stores.

5.2.4.1 The Problem

- Analyze the distances travelled from store to customers
- Areas each store will cover
- Distances that will be travelled: The following will influence this:
 - The transport method used
 1. Hired trucks
 - Number of orders a truck can hold and generally takes in one load
 - Cost of petrol used by the trucks per kilometre
 - Cost of the hiring of trucks
 - Staff costs
 - % of petrol and truck costs that should be added for the case where an order is wrong and a second delivery must be made. (Analysis of how many second deliveries are made)



2. Owner's own form of transport
3. Outsourced transport company used
 - How many stores are used

5.2.4.2 The Solution

5.2.4.2.1 Distances travelled to customers:

In the report provided by the current contracted transportation company it is indicated for the Kenilworth store an average of 9.98km are travelled for each order. Keeping in mind that this is not the distance from store to the customer, this is the average of round trips to multiple customers divided by the number of customer.

In an analysis of the active customer at the Kenilworth store (customers who have shopped more than four times in the past year) the average distance between them and the store was calculated to be 11.1km. (See Appendix R) This means that a return trip straight to the customer and back to the store would be on average 22.2km. In one case orders are delivered to a customer 36km from the Kenilworth store. These figures are only based on the customers position and does not indicate how often each of these customers use the service and therefore cannot be compared to the travelling distance of 9.98km which is based on actual orders and deliveries made in batches. The only information that can be obtained from this is that Pick n Pay is allowing far distances to be travelled to customers which will be reduced with the new model and the use of franchise stores.

Although delivering multiple deliveries in one trip reduces the travelling distance drastically, when franchise stores are used there are going to be less customers assigned to each store and therefore a smaller customer density. For deliveries to be viable, small areas must therefore be serviced by each store. This will be discussed after the current and possible transportation options have been analysed.

5.2.4.2.2 Current Transportation method analysis:

Transportation outsourced to a logistics company:

This is the current method used. The exact amount spent on hiring of trucks cannot be disclosed for confidentiality reasons but what can be said is, for the volume of orders that will be delivered by franchise stores, it will definitely not be viable to continue with this method.



Values have been altered but kept in proportion to show that this current method is extremely uneconomic. All spreadsheets used for working out values are shown in Appendix M.

The trucks currently used for online shopping are Toyota D-4 D minivans and Nissan dCi120 minivans. The available space in the back of these vehicles, the size of the bins that orders are packed into and the maximum number of bins each truck can hold at full capacity are all shown in Appendix M.

- The Toyota D-4D maximum capacity is 57 bins
- The Nissan dCi120 capacity is 64 bins.

Because items in online shopping orders are generally not very heavy, weight of these products for packing of the truck was not taken into consideration when determining its maximum capacity.

An analysis of the utilisation of trucks, average km travelled per hour and the cost of delivering one order (taking into account diesel, maintenance and tyres) was then completed for the Kenilworth Store alone as well as one for the stats of the whole country. The results were as follows:

- Kenilworth:
 - Current utilisation of trucks
 - Toyota D-4D: 33%
 - Nissan dCi120: 29.44%
 - Average km travelled per order (truck type not considered):
 - 9.98km (LiebenLogistics, 2010)
 - Cost of diesel, maintenance and tyres when delivering one order:
 - R11.88

 - The whole country::
 - Current utilisation of trucks
 - Toyota D-4D: 61%
 - Nissan dCi120: 54%
 - Average km travelled per order (truck type not considered):
 - 13.05 km (LiebenLogistics, 2010)
 - Cost of diesel, maintenance and tyres when delivering one order:
 - R15.50
-



Because at Pick n Pay a set rate is currently paid to the logistics company providing the transport, to work out the full price of delivering each order the only variables needed were:

- How much the logistics company charges for the service
- How many orders are completed.

Actual costs per delivery could not be provided for confidentiality reasons but with these values, it was worked out that the delivery fee charged to customers cover the following percent of the full cost of delivering an order:

- Kenilworth: 39.5%
- Whole Country: 35%

Pick n Pay is currently provided with a fleet of 25 trucks for deliveries. (Cotterell, 2011) If trucks were used to their full capacity, or at least close to their full capacity, these costs could be reduced as fewer trucks would be needed. As worked out above, the running cost of the trucks is only R11.88 per order in Kenilworth and R15.50 per order if the whole country's orders are considered. (AA, 2011) This is a small portion of the total costs so the ideal situation is less trucks and more travelling of each truck.

From the results shown, it is not economical to continue with the current delivery methods.

5.2.4.2.3 Transport options for franchise owners:

There are three options for store owners. They can either buy a panel van, rent one or alternatively use an external delivery service to deliver their orders.

In this section we will investigate each of these options.

5.2.4.2.3.1 *Buying a new Panel Van*

In this analysis we looked at buying a new Toyota panel van and then buying a second hand panel van. The Toyota was the cheaper of the two used at Pick n Pay. In this analysis insurance and resale value have not been considered. We assume the store owner will pay the vehicle off in 5 years and that the resale value will be higher than the



costs of insurance over these five years. Therefore, the costs we have calculated will be sufficient as the resale value will cover insurance and provide a deposit when a new vehicle is purchased after 5 years. There is also the option of purchasing a mini panel van which is cheaper but may not be sufficient in the future.

For this analysis values have been altered for we assume that:

- a store will complete 100 orders per month
- Drivers earn R5000 per month. This is a low value but drivers will probably work half day when only 100 orders are being completed per month.
- One truck is bought by a franchise store
- AA standards are used and applied to Kenilworth's statistics to find the delivery cost per order

<u>new vehicle</u>	
Cost of a new Toyota panel van	260000
Cost of a new Toyota panel van split over 60 months	4333.33333
Cost of a new Toyota panel van per order	43.3333333
Driver	5000.000
Driver per order	50
delivery cost of each order	14.7740926
current delivery fee	60
Total cost of van and deliveries	108.107426
Percent of the costs that delivery fee covers	0.5550035

Table 8- % of cost delivery fee would cover if new vehicles are bought for franchise stores



<u>used vehicle</u>	
Cost of a used Toyota panel van	150000
Cost of a used Toyota panel van split over 60 months	2500
Cost of a used Toyota panel van per order	25
Driver	5000.000
Driver per order	50
delivery cost of each order	14.7740926
current delivery fee	60
Total cost of van and deliveries	89.7740926
Percent of the costs that delivery fee covers	0.66834427

Table 9- % of cost delivery fee would cover if used vehicles are bought for franchise stores

From Table 8 it can be seen that if a new vehicle is bought this early on in the growth of the service, it will not be economical as the total cost of delivering the order will be almost double the fee being charged to the customer. In Table 9 it is shown that it is not economical to buy a second hand vehicle at this point of the business as the delivery charge will only cover 67% of the delivery costs.

The only way that buying a vehicle will be viable for franchise owners is if they use the vehicle for other uses too. For example, they Franchhoek Franchise store supplies the local express store in the area and therefore the same vehicle could be used for both.

The analysis made for this option can be seen in Appendix M.

An analysis was done on buying new vehicles to service the current Kenilworth Stores.

The exact Kenilworth Stats were used here and the following was found:

<u>new vehicle for current model</u>	
Cost of a the new Toyota panel vans (x3)	780000
Cost of the new Toyota panel vans split over 60 months	13000
Cost of a new Toyota panel van per order	44.2678774
Drivers x3	15000.000
Driver per order	17.0261067
delivery cost of each order	14.7740926
current delivery fee	60
Total cost of van and deliveries	76.0680767
Percent of the costs that delivery fee covers	0.78876715

Table 10- Analysis of new vehicles being bought for current model



In Table 10 it is shown that if three new vehicles were bought to service the Kenilworth online shopping customers, 79% of the costs would be covered by the delivery fee charged to customers. This is still not economical enough to implement but is a vast improvement from the statistics found from the current method used.

5.2.4.2.3.2 Using a delivery company for deliveries

The second option for franchise owners is to use existing delivery companies to deliver their orders. This is different from hiring a logistics company that provides Pick n Pay with their own vehicles in that they are constantly making deliveries and include the Pick n Pay orders into trips they are making with their own other deliveries.

The delivery company being considered as a partner to online shopping at Pick n Pay cannot be named in this report as this option is currently being considered and details are confidential.

For use in this report we are going to call this company “Devine Deliveries”. In analysing this option, the average price of delivery was obtained per km by looking at distance to different areas and the prices they charge to travel to these areas. These charges are fairly low as Devine Deliveries has many hubs throughout the country. They are as widely spread as the Pick n Pay Franchise stores

Because Pick n Pay is currently in negotiation with Devine Deliveries, direct contact with them regarding prices was not possible. An analysis has to be conducted from the information obtainable from their website. However, it can be assured that a better deal can be negotiated with this company than what is shown here as this is the price given to every day, once off users.

Delivery Price/km	4
Delivery Price/order	40
KM allowed to travel:	15

Table 11- Cost of using an outside delivery service

If this method was used and we assume that the average distance travelled to each client is 10 km, as was recorded at Kenilworth, the delivery cost will be R40.



It is not realistic to assume this for the new model as travelling distances will be shorter and orders will be fewer. We therefore worked out, at the current price/km what distance can be travelled within the delivery fee currently charged. The result was 15km. This means that, from each store, a distance of no further than 7.5km should be travelled to a customer.

In order to extend this limit, we assume that:

- More than 4 orders will be delivered at a time in the area
- This company will reduce the cost of delivering for the franchise stores on a regular basis
- We will offer few, high demand delivery slots so that more orders are delivered in one trip.

After making these assumptions, we move the limit to a 10km radius of the store.

5.2.4.2.3.3 Conclusion:

From the options analysed, it is decided that the best option for franchise stores is to use Devine Deliveries until their personal service is big enough to purchase their own vehicle or they have other uses for a vehicle that is purchased. Devine Deliveries is the only option that is viable when the business is small and will continue to be viable once it grows.

If store owners decide to purchase vehicles, strict rules must be put in place with the vehicles bought, the branding on the vehicle and the upkeep of the vehicle. The reason for this is that the online shopping service represents the Pick n Pay Company and therefore a certain standard must be maintained.



Figure 22- Pick n Pay Online Shopping Delivery Vehicle



5.2.5 Delivery Time Slots

Delivery time slots in conjunction with the picking speed need to be redesigned to ensure customers receive items when they are scheduled to. The more efficient the picking system is, the smaller the delivery slots can be and the more convenient the service is for customers. The biggest selling point of online shopping is convenience so it is very important to ensure the customers are getting the service they want and that it is efficient and reliable.

5.2.5.1 The Problem

Orders don't always arrive at customers on time so with the current model smaller delivery slots could not be offered. At the same time, customers are drawn to this service because of its convenience and the smaller the delivery slots, the more convenient the service is and therefore, the more customers it will attract.

An analysis needs to be done on how many deliveries can be made throughout a given area within a certain space of time in order to determine how small the delivery slots can be made without making the process inefficient (half empty trucks travelling) and expensive.

When starting an analysis like this it is always important to keep in mind that once you offer something to a customer it is very hard to take the service away without doing damage to the company. Therefore smaller time slots should not be offered until the current ones are working 100 percent and every delivery is being made on time and the company is absolutely sure they can handle a tighter deadline.

Things to consider:

- This analysis can only be completed once the picking methods have been improved and the new picking rate is known.
 - A customer survey must be completed indicating what order slots the customers would ideally like to have
 - In the survey options that are possible with the new picking method should be indicated and the customer asked to select the one they would prefer.
 - How many orders a truck can hold must be taken into consideration
 - How many orders a truck can deliver in a given time frame with the new max delivery distance must be considered
-



- The number of orders completed a day must be considered
- The number of trucks available/used must be considered

5.2.5.2 Solution:

With the new model the process will be more efficient because picking speeds will be faster and more reliable for the following reasons:

- The earlier picking starting time of 6:30am allows more time for items to be picked before delivery time slots.
- The early picking times, while stores are empty and, and the strict management will mean picking speed will be increased.
- There will be fewer orders at each store so order picking will be a lot less complicated and more likely to be completed on time.
- Availability of products will be integrated on the website so pickers will not waste time looking for items that are out of stock
- Items on the shelves will be more likely to be fresh and shelves will be stocked efficiently so pickers will visit the store room less frequently.

Most of the answers to the considerations mentioned above has already been analysed in this report so far.

- The new picking rate has been set at 30 seconds per item which, according to our analysis and with the improvements made to the methods is a very safe speed even though it is half the speed currently expected from pickers.
 - The new model will originally use Devine Deliveries so capacity and utilisation of trucks will not be important. Some franchise owners may already own delivery vehicles for other services in which case the capacity and cost of running these vehicles will be similar or the same and the values calculated in Appendix M.
 - The new max delivery distance to customers is 10km. This is to satisfy the costs of using Devine Deliveries assuming they will offer a discounted rate to Pick n Pay due to the large amount of business they will receive from online shopping. This short delivery radius means that customers are close to each other and short distances will be travelled between orders and therefore many deliveries can be made in a short space of time.
-



- There will be few orders each day to start off and this will increase as more customers are attracted to the service. Franchise owners usually know their shoppers and so, while being good at running the service, they will also be good for advertising and growing of the service with their local customers.
- There will be a maximum of one truck at each store but more stores will work through Devine Deliveries and therefore not have to worry about the delivery logistics.
- The results from a customer survey are shown in Figure 23 below and will be discussed in the conclusion of this section.

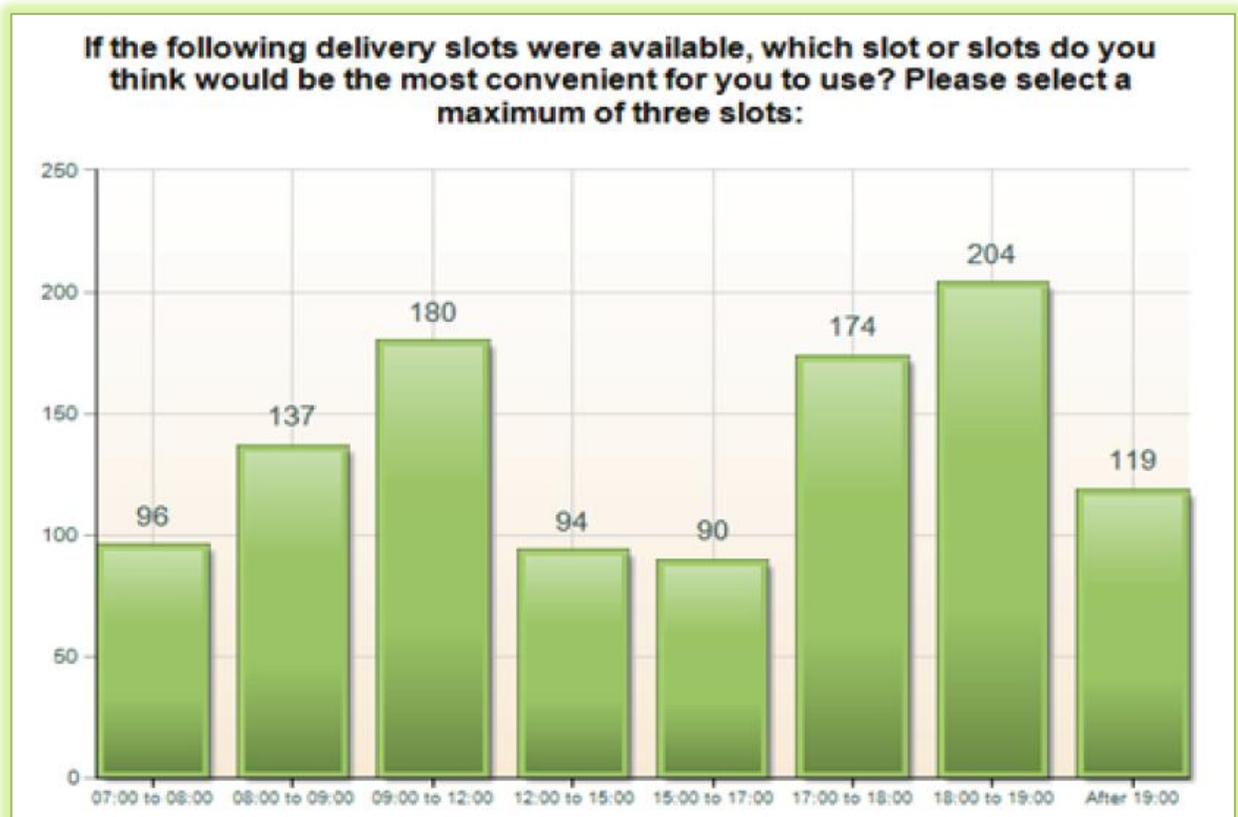


Figure 23- Results of customer survey regarding customers preference of delivery time slots

Because we are confident in our new picking methods and delivery process but will start out with few orders, we will offer the two most popular time slots which are in the morning between 9am and 12pm and in the evening between 6pm and 7pm. The



morning orders can be collected by Devine deliveries at 9am and then again at 6pm. The advantage of using Devine deliveries is that they have their own storage facilities which mean that they do not need to return to the store with returned goods until they are returning to collect more orders to deliver to customers. They can, on arrival at their hubs after delivering, store the items there while they continue with their own other others and return the items when they return to the store to collect the next set of orders. Apart from saving petrol, this is also convenient because the Pick n Pay stores generally close at 19:00 and with this method will not have to stay open and wait for returns of goods.



6. Final conclusions

The aim of this report was to research, identify, analyse and recommend improvements for the current Online Shopping service and its processes at Pick n Pay. It was established, based on research conducted, that all online shopping companies start out making a loss in the development stage of the company, as in the case of Pick n Pay.

Therefore, it was established that the focus of this project is not to increase revenue but to minimise cost and increase the customer service level and efficiency in order to grow the service and customer density to a profitable level.

6.1 Online Shopping Research:

The research for this project was focused on two online shopping business types namely existing grocers offering online shopping as an added service to customers and newly established companies offering only online shopping. There were six international online shopping companies researched. They are Schnucks, Colruyt, Webvan, FreshDirect, Peapod and Streamline.

From these companies the following was established about how to start an online shopping service:

- Start by running the service from stores instead of a distribution centre if possible
- Start conservatively, minimizing cost as far as possible.
- Ensure 100% customer satisfaction
- Focus on small geographic area with high customer density
- Start by offering a limited service and perfect it before expanding the service offered
- Ensure the service is easy to use and convenient for customers
- Integrate in store and online shopping processes and staff responsibility

6.2 Competitor Research:

Woolworths is Pick n Pay's only online grocery shopping competitor in South Africa. Research was conducted on their activities and methods and a comparison was made



with Pick n Pay. This comparison can be seen in Table 1. The improvements that can be made at Pick n Pay, which Woolworths has already implemented, are the following:

- Limit the distances travelled to customers
- Reduce set up costs in order to have more stores running online shopping and shorter travelling distances
- Take more variables into consideration and do a proper evaluation when selecting stores used for online shopping
- More efficient picking methods
- Online shopping processes such as ringing up, storage of orders, etc at the store need to be evaluated and changed
- Delivery time slots could be made more convenient with a more efficient system.

6.3 The Website

The current website is user friendly and attractive but some of its features cause activities later in the online shopping process to be inefficient.

The two main improvements that should be made to the website are:

- Area of customer identified:
 - The geographic locator on the website needs to be upgraded to ensure all potential customers' locations can be identified
 - The geographic locator needs to identify the location of a registering customer and indicate if this customer is in a serviceable area. With the new model, orders will only be delivered within a 10km radius of each online shopping store. The website needs to identify if the customer is within this area in order to decide whether the customer should be allowed to use the service or not.
- Store Catalogue:
 - The catalogue that appears on the website should not only identify the products that the store offers but also whether they are available or not. The out of stock rate for online shopping orders was calculated, during time studies conducted, to be 18%. This slows down the picking process and causes pickers to become frustrated.



6.4 Store Selection:

When selecting the types of stores to be used for online shopping there were two main decisions to be made, what type of store should be used and which specific stores should be used.

Analytical Hierarchy was used to decide on the type of store that should be used. The three options were Hypermarkets, Corporate Supermarkets and Franchise stores.

After analysing the six main objectives to be fulfilled, it was decided that franchise stores are the best option for the following reasons:

- They are widely spread and can each cover small areas of customers, 10km radius, thereby having short travelling distances (see map in Figure 12)
- Franchise stores are privately owned and will be responsible for the in store costs, use of franchise stores will reduce the costs of Pick n Pay by 98.7%
- In store staff can be used to pick online shopping orders as the online shopping service will be run as part of the store and not as a separate department
- Because there will be more stores used, each store will be allocated fewer orders and can therefore perfect the service and offer good customer service
- Owners of Franchise stores are prepared to go the extra mile for customers and will therefore offer a very appealing service in order to increase their revenue. (see letter to franchise store from customer in Appendix I)

The main concern with running online shopping from franchise stores is that all profits made from online shopping orders will go to the franchise owners. This means that initially Pick n Pay will not make a profit from this service. However, franchise stores have limited space and can therefore only service a limited number of customers. Once this number has been exceeded, the online shopping concept would have grown in South Africa and Pick n Pay can take on the remaining customers. Once South Africans take to the online shopping concept, the number of customers serviced by franchise stores will be only a small portion of the serviced customers. The use of franchise stores is merely to increase the interest in online shopping in South Africa.



The second decision to be made is which specific franchise stores will be used for online shopping

**this will be completed with section 5.2.2.2*

6.5 Analysis of in store processes

6.5.1 Picking methods:

Time studies were conducted in order to analyse the picking methods. After observing the problems discussed in section 5.2.3 the following recommendations are made:

- Picking starts at 6:30 am
- Working shifts are set out according to Table 7
- Staff are responsible for in store and online shopping activity and therefore work as a team in running the store
- Handheld scanners are not used as they are too expensive, orders are printed
- Pickers are expected to pick at a rate of 30 seconds per item excluding check out time

6.5.2 Online shopping Store room:

- To start out a freezer and fridge will be placed in the online shopping room for storage of fresh products in orders
- Orders will be packed in bins/trolleys with clearly displayed whiteboards displaying which order it is and which delivery slot it belongs to.
(See Appendix Q for proposed online shopping room layout)

6.5.3 Check out

Cashing up and packing of items will take place at the in store checkout counters.



6.6 Delivery of orders

6.6.1 Delivery Method

Deliveries will be completed by divine deliveries at a cost of R4 per km unless store already owns a delivery vehicle that also has other uses. A customer must be within a 10km radius of the store in order to receive delivery.

6.6.2 Delivery Time Slots

Two delivery sots should be offered between 9:00 and 12:00 and between 18:00 and 19:00.

7. Bibliography

AA. (2011, September 3). *Automobile Assistance*. Retrieved September 8, 2011, from Automobile Assistance.

Background on Peapod. (2011). Retrieved May 15, 2011, from Peapod official Site: http://www.peapod.com/corpinfo/GW_index.jhtml;jsessionid=TXUKFSI424YV2CQBD0W SIIQ

Clayton, A. (2011, September 27). Information Systems Manager. (P. Walker, Interviewer)

Cotterell, M. (2011, January 15). Head of online shopping Pick n Pay. (P. Walker, Interviewer)

de Wet, K. (1999). Analysis of Six Sigma impl. *International Journal of Quality* , 45-49.

Fresh Direct History. (2009). Retrieved May 2011, from Fresh Direct Website: <http://www.freshdirect.co.uk/about/history.aspx>

Glasner, J. (2010, October 7). *Why Webvan Drove Off a Cliff*. Retrieved May 15, 2011, from Wired: <http://www.wired.com/techbiz/media/news/2001/07/45098>

J, B. (2032). *Sport solutions for dummies*. New York: McGraw-Hill.

Jackson, R. (2011). Kenilworth Store Online Shopping Manager. (P. Walker, Interviewer)

Kendall, J., & Kendall, K. (2007). *Systems Analysis & Design*. New York: Prentice Hall.

Marius Janson, D. C.-K.-P. (2007). *E-Grocer Strategies: A case study*. Retrieved April 20, 2011, from [http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1057&context=ecis2007&sei-redir=1#search="E-Grocer+Strategies:+A+case+study"](http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1057&context=ecis2007&sei-redir=1#search=)

Peapod Delivers 'Express Line' Service Through Superior Routing. (n.d.). Retrieved May 15, 2011, from Roadnet technologies: <http://www.roadnet.com/pub/case-studies/Peapod-Delivers-Express-Line-Service-Through-Superior-Routing/>

Richard R. Johnson, L. K. (2000). Retrieved May 10, 2011, from Online Grocery: How the internet is changing the grocery industry: <http://www.csus.edu/indiv/c/chingr/mis270/darden-PeapodCaseStudy.pdf>

Saayman, D. (2011, September 10). Sable Square Store Owner. (P. Walker, Interviewer)

Schnucks' history. (2011). Retrieved April 20, 2011, from Schnucks' official website: <http://www.schnucks.com/about.asp#history>

Scott, K. (2011, May 25). Mr. (P. Walker, Interviewer)

Weiss, T. R. (2001, July 16). *Online Grocer, Webvan crashes with a thud*. Retrieved April 21, 2011, from http://www.computerworld.com/s/article/62171/Online_Grocer_Webvan_Crashes_With_a_Thud

Appendix A	Running and set up costs of Online Shopping
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*Please note that due to confidentiality reasons, actual values could not be provided so all values have been edited for use in this project. All values are still relative to each other and therefore final percentages calculated are accurate.

*The Salary of the Head of Online Shopping was kept confidential and therefore the value was estimates.

*A value for the price of a new PC was researched and an average estimate made

Online Shopping central management		Staff	PP cost	Total cost
Head of OS		1	800000	800000
National Operations Manager		1	568802	568802
Sales & Site manager		0	446891	0
Clerk & Data clerk		1	137192	137192
Catalogue & Data manager		0	254621	0
OS Marketing Manager		0	507147	0
Reporting & Analytics manager		0	507147	0
OS regional Co-ordinator		1	247837	247837.4
Expenses admin clerk		1	188422	188421.8
Payments and Call Centre clerk		1	191468	191467.7
Filing clerk		1	105600	105600
				2239320.9

Table 12- Expenses regarding online shopping central management

Online Shopping in store staff		Staff	PP Cost	Total Cost
OS Manager		9	184320	1658880
Assistant OS Manager		11	150656	1657216
Perm Pickers		34	43123.2	1466188.8
Perm Cashiers		15	43123.2	646848
Perm Packers		3	35843.2	107529.6
VTE Pickers		30	30912	927360
VTE Cashiers		4	30912	123648
VTE Packers		4	26880	107520
Recon staff		3	56643.2	169929.6
Security		15	75360	1130400
Bin porter & cleaner		0	36000	0
Cleaner		5	36000	180000
				8175520

Table 13- Expenses regarding online shopping in store staff

Set up costs- Corporate Store		No. req	Cost/unit	Total cost
Network		7	50955.4	356687.898
PC		7	2800	19600
Bins		1245	100	124500
Cooler boxes				
Vehicles		25	537569	13439222.4
				13940010.3

Table 14- Total set up costs of online shopping at a corporate store

Saving made by moving to franchise stores				Total costs
Head office staff				2239321
In store staff				8175520
Transport				161270669
Total				171685510
Savings:				98.70%

Table 15- Percent Saved at Pick n Pay by moving online shopping to franchise stores

Appendix B Store Type selection- Analytical Hierarchy

- Identification of possible solution and objectives:

Possible Solutions:

- Hypermarket
- Franchise Store
- Corporate Store

Objectives:

1. Good physical location with regards to position of customers
2. Minimise set up and running costs
3. Good customer service (management and efficiency) from store and catalogue accuracy
4. Operational Conditions must be realistic for online shopping (space and receiving bay)
5. Maximise profit made my the Pick n Pay company
6. Maximise the control that the Online shopping top management has over operations at stores

- Weighing the importance of objectives:

Weighed Objectives							
		1	2	3	4	5	6
A	1	1.00	0.17	0.20	0.20	3.00	0.33
	2	6.00	1.00	2.00	2.00	7.00	2.00
	3	5.00	0.50	1.00	1.00	5.00	2.00
	4	5.00	0.50	1.00	1.00	5.00	1.00
	5	0.33	0.13	0.20	0.20	1.00	0.20
	6	3.00	0.50	0.50	0.50	5.00	1.00
		20.33	2.79	4.90	4.90	26.00	6.53

Table 16- Weighing of objective's importance against each other

		1	2	3	4	5	6
Anorm	1	0.04918	0.0597	0.04082	0.04082	0.11538	0.05102
	2	0.29508	0.35821	0.40816	0.40816	0.26923	0.30612
	3	0.2459	0.1791	0.20408	0.20408	0.19231	0.30612
	4	0.2459	0.1791	0.20408	0.20408	0.19231	0.15306
	5	0.01639	0.04478	0.04082	0.04082	0.03846	0.03061
	6	0.14754	0.1791	0.10204	0.10204	0.19231	0.15306

1	0.05949	} wT
2	0.34083	
3	0.22193	
4	0.19642	
5	0.03531	
6	0.14602	

Table 17- Final objective weights

Check for consistency	1	2	3	4	5	6	
1	1.00	0.17	0.20	0.20	3.00	0.33	0.05949
2	6.00	1.00	2.00	2.00	7.00	2.00	0.34083
3	5.00	0.50	1.00	1.00	5.00	2.00	0.22193
4	5.00	0.50	1.00	1.00	5.00	1.00	0.19642
5	0.33	0.13	0.20	0.20	1.00	0.20	0.03531
6	3.00	0.50	0.50	0.50	5.00	1.00	0.14602
1/n*sum(AwT/wT)	6.0498						
CI=	0.00996						
CI/RI	0.00803	<.1	therefore satisfactory decision making				

0.35457	} AwT
2.07368	
1.3548	
1.20878	
0.21062	
0.88063	

Table 18- Check for consistency of objective weighing

- Each possible solution's ability to satisfy each of the six objectives:

A				Anorm				wT	
Objective 1									
	Hyper	Franchise	Corporate			Hyper	Franchise	Corporate	
Hyper	1.00	0.14	1.00		Hyper	0.11	0.11	0.11	0.11111
Franchise	7.00	1.00	7.00		Franchise	0.78	0.78	0.78	0.77778
Corporate	1.00	0.14	1.00		Corporate	0.11	0.11	0.11	0.11111
Objective 2									
	Hyper	Franchise	Corporate			Hyper	Franchise	Corporate	
Hyper	1.00	0.20	2.00		Hyper	0.15	0.14	0.25	0.18223
Franchise	5.00	1.00	5.00		Franchise	0.77	0.71	0.63	0.70284
Corporate	0.50	0.20	1.00		Corporate	0.08	0.14	0.13	0.11493
Objective 3									
	Hyper	Franchise	Corporate			Hyper	Franchise	Corporate	
Hyper	1.00	0.25	2.00		Hyper	0.18	0.17	0.25	0.20141
Franchise	4.00	1.00	5.00		Franchise	0.73	0.69	0.63	0.68064
Corporate	0.50	0.20	1.00		Corporate	0.09	0.14	0.13	0.11795
Objective 4									
	Hyper	Franchise	Corporate			Hyper	Franchise	Corporate	
Hyper	1.00	5.00	5.00		Hyper	0.71	0.63	0.77	0.70284
Franchise	0.20	1.00	0.50		Franchise	0.14	0.13	0.08	0.11493
Corporate	0.20	2.00	1.00		Corporate	0.14	0.25	0.15	0.18223
Objective 5									
	Hyper	Franchise	Corporate			Hyper	Franchise	Corporate	
Hyper	1.00	7.00	1.00		Hyper	0.47	0.47	0.47	0.46667
Franchise	0.14	1.00	0.14		Franchise	0.07	0.07	0.07	0.06667
Corporate	1.00	7.00	1.00		Corporate	0.47	0.47	0.47	0.46667
Objective 6									
	Hyper	Franchise	Corporate			Hyper	Franchise	Corporate	
Hyper	1.00	6.00	0.50		Hyper	0.32	0.43	0.30	0.34957
Franchise	0.17	1.00	0.14		Franchise	0.05	0.07	0.09	0.07034
Corporate	2.00	7.00	1.00		Corporate	0.63	0.50	0.61	0.58009

Table 19- Score for each solution for each objective

- Final Decision Making:

Decision of store type						
	1	2	3	4	5	6
Hyper	0.111111	0.182234	0.201411	0.702839	0.466667	0.34957
Franchise	0.777778	0.702839	0.680643	0.114927	0.066667	0.070339
Corporate	0.111111	0.114927	0.117947	0.182234	0.466667	0.580092
Final Objective scores						
1	0.059487					
2	0.340828					
3	0.221933					
4	0.196423					
5	0.035313					
6	0.146016					

Final Store scores				
Hyper	0.318996			
Franchise	0.472071			
Corporate	0.208933			
Therefore the best option is to use franchise stores				

Table 20- Final Scores and decision

Appendix C **Woolworths Online Shopping
Questionnaire**

FINAL YEAR PROJECT

ONLINE SHOPPING

COMPANY OF INTEREST: WOOLWORTHS

STUDENT:

PIA WALKER

FOURTH YEAR INDUSTRIAL ENGINEERING

STELLENBOSCH UNIVERSITY

PLEASE COULD YOU ANSWER THE FOLLOWING QUESTIONS WITH AS MUCH DETAIL
AS POSSIBLE.

PLEASE INDICATE IF THERE ARE ANY QUESTIONS THAT CANNOT BE ANSWERS.

YOUR TIME AND HELP IS GREATLY APPRECIATED

STORE ALLOCATIONS

- 1) Do the orders for online shopping come from a store or a distribution centre?

Stores. We use 18 stores to provide coverage for our delivery footprint across South Africa.

- 2) If stores are used, how many stores in the Cape Town area are a part of the online shopping service?

Two stores manage the fulfillment for the main metropolitan area . One store for Somerset West and one store for Paarl.

- 3) If stores are used, how were the stores used for online shopping selected. (E.g. areas with high customer density, stores that contain the most products, free storage/pickup and drop off space.)

The following factors played a part in selection:

- Size of Catalogue. We chose predominantly stores that sell the broadest catalogue of items.
- Physical location. We use a rule-of-thumb 15km radius for fulfillment for each store – so we chose stores that would give us the most efficient coverage of our highest density areas.
- Operational conditions. For example placement of stores, in a mall , or in a high street . Road access conditions. Physical infrastructure and space within store etc.

- 4) Were proper calculations done to determine the most beneficial stores to use or were they selected for specific reasons? If they were selected for specific reasons, what are the reasons?

Answered above. We have examples where we chose a store with a relatively poor catalogue , in preference because the infrastructure was so much better than the store with the better catalogue.

- 5) At Woolworths, would you rather travel further distances and set up fewer stores for online shopping or vice versa and why?

Our model would work better with more stores, with shorter fulfillment distances. We prefer to do shorter distances between deliveries. The ideal would be high volume , low distance from the hub , and short distances between deliveries.

- 6) If a distribution centre is used, why have you chosen this method over using individual stores?

Our first attempt at online fulfillment WAS based on a DC model. It is preferable because merchandise availability is easier to guarantee , space is not an issue , and high order volumes are easier to manage. But the DC model is extremely cost intensive – and we found it to be unsustainable at the low volumes that we were experiencing.

- 7) If stores are used, do you think that Woolworths will eventually run online shopping from a centralized DC?

I think it is possible that we will centralize at some point. Although I doubt that we will have enough volume of foods to justify this in the next 5-8 years. It is almost certain that we will centralize non-foods at some point in the next 2-3 years.

CUSTOMER RESEARCH

- 1) How many active online shopping customers does Woolworths have in the Cape Town area?

Actual numbers are confidential. About 32% of our total online order volume comes from the Cape Town area.

- 2) How many active online shopping customers does Woolworths have in South Africa?

Actual numbers are confidential. Our registered user base is around 400 000 . Only about 10% of those could be classified as active. But this registered base grows by several thousand users per week – equally lots of users become dormant every week.

PICKING METHODS AND STORE ACTIVITY

- 1) How is it decided how many pickers are needed for a store/DC?

We use a productivity measure based on our average order size. We know that at high efficiency an online picker can take a R500 order through our systems from end to end in 1 hour. We apply this to each location for staff planning.

- 2) If stores are used, do the pickers have problems picking when the store is full? How do they get around this problem?

This can be a challenge. We pick early in the morning – and 80% of our volume is picked before the store opens for trade. But at peak times this can be difficult. We have designed a new method for picking which will allow us to use a mobile device in future – will give us more options.

- 3) How many SKU's are pickers expected to pick in an hour? Do they pick at this rate?

Picking is not the only aspect we focus on. We take an end-end view of productivity. Including substitution, interaction with the customer, packing the order and dispatch.

- 4) Is picking done with a hand held scanning device or manually with a shopping list and items scanned later? Why?

Current : Manual printed picking list . Scanned later at our point of sale.

Future : Hand held wireless scanner devise. Direct upload. No point of sale required.

- 5) If stores are used, is there a separate till area within the store for online shopping orders?

No – most stores use their standard point of sale on the floor. Not required in future model.

- 6) How accurate is the list of available products on your website?

Million dollar question. We take a feed of what should be in the store from our forecasting system. But it is not that accurate. In practice we are around 10% out of stock at a gross level. But we close this gap to 1% on substitution.

- 7) How do Woolworths deal with the situation of an items being ordered that is actually not available at the store.

We offer the customer substitution, or we leave the item out if the customer has requested no substitution.

- 8) What computer system is used to indicate what items are available within the store/DC?

Currently we are taking data from our forecasting and store cataloging systems to do this. In our future model we will be reading the store's actual balance on hand inventory and using this data to switch availability indicators.

- 9) Between what times does picking take place?

Most stores begin at 06h30. They pick most days until around 15h00. Orders are dispatched over three waves in the day.

10) How are fresh and frozen products stored once they have been picked?

Everything is delivered on the day of picking. Completed orders are packed and then stored under cold chain until dispatch. Items requiring special storage, i.e. Warm or Frozen are kept in the required area and consolidated before dispatch.

11) Briefly describe the method from order received from customer, at the store/DC, to loading of the truck.

- Picking team arrive at work.
- Print summary of orders for picking.
- Print individual picking sheets. Allocate to pickers.
- Begin pick wave one. Orders for 09h30 release.
- Pick all items to trolley.
- Pick possible substitutes at same time – hold separate.
- Finish Pick. Call customer and confirm substitutes. Yes No.
- Ring up at POS.
- Pack for delivery.
- Complete delivery documents.
- Hold for dispatch.
- Hand over to drivers.
- Begin wave 2... etc.

DELIVERY TIME SLOTS AND DELIVERIES

1) How did Woolworths decide on the delivery time slots to offer customers? Have they always used the same time slots? If not, why were they changed?

This was designed in the customer journey. Initially we offered timed 2 hour slots at a premium and an all-day slot at a discount. We have evolved based on customer feedback. Slots are designed to optimize the customer experience as well as to ensure that we have a balanced load on the picking teams.

2) Roughly, what percentage of deliveries makes it to the customer within the time slot selected by the customer?

Roughly.... 97.31 % (so far this year)

3) What is the process used to deal with items that are in the order but are not wanted by the customer/items that are missing from an order?

These scenarios are all handled by our customer service team.
Item in the order but not wanted / not ordered. We tend to just credit the customer.
Item missing are credited or worst case re-delivered.

- 4) What is the maximum number of orders a truck can hold?

We use small LDV vehicles in our model. Not trucks. Variable.

- 5) On average how many orders are delivered by one truck?

Most of our drivers are taking 5-10 orders per wave. Depends on vehicle.

- 6) On average, how many orders are delivered within an hour by one truck.

Not measured.

- 7) What criteria are used, if any, to decide which orders are allocated to which delivery trucks? Is this process done by a program or manually?

Manual. Each sector of a fulfillment store is allocated to one or more delivery agents. Any order for delivery in that sector is allocated to that driver.

- 8) Do Woolworths use their own trucks for deliveries or do they have a contracting company?

Contracted.

- 9) Briefly describe the delivery process from packing the truck and departure from store to returning to store.

Driver arrives at picking store at allocated dispatch time.

Orders handed over and driver works out optimized route and schedule for his batch of orders.

Driver makes delivery within delivery time. Unpacks delivery boxes at each delivery and gets a proof of delivery signature.

After wave 1 complete driver returns to store to drop empty equipment and collect wave 2 deliveries.

THANK YOU FOR YOUR TIME AND INPUT, IT IS GREATLY APPRECIATED!

Appendix D Franchise Owner Questionnaire

ONLINE SHOPPING AT PICK 'N PAY FRANCHISE STORES

PLEASE NOTE: THIS SURVEY IS FOR USE IN A UNIVERSITY PROJECT ONLY. ALTHOUGH THE RESULTS WILL BE VIEWED BY PICK 'N PAY ONLINE SHOPPING MANAGEMENT, THIS SURVEY DOES NOT NECESSARILY REPRESENT THEIR VIEWS OR PLANS FOR ONLINE SHOPPING IN THE FUTURE.

THANK YOU FOR TAKING THE TIME TO FULL OUT THIS SURVEY.

PLEASE BE AS DESCRIPTIVE AND HONEST AS POSSIBLE WHEN ANSWERING THE FOLLOWING QUESTIONS.

1. How accurate is your stock take on the SAP system? (a percentage is sufficient)

.....

2. At receiving, are items scanned or manually entered into SAP data base?

.....

3. When items are sold and scanned at the till, are they automatically removed from stock in store on the SAP system or is this done manually?

.....

4. How reliable are your fresh produce suppliers and between what times do they usually deliver each day?

.....

5. How does your security process work in store and at receiving?

.....

6. Would you be interested in running online shopping from your store to your surrounding areas? Why?

.....

.....

If you answered 'yes' to the previous question, please answer the following questions:

7. Do you currently run any form of home shopping from your store?

.....

8. If yes, please explain the service you offer.

.....

.....

.....

9. If you answered yes to question 7, would you prefer to continue your current service or implement a full online shopping service with the possibility of increasing your customer density? Why?

.....

.....

10. Would you use your current staff or hire new staff to run the online shopping service?

.....

11. Would you be prepared to cover the set up costs for the service at your store (bins, trolleys, computer, network connection, scanners and staff)

.....

12. Do you have an available area of least 10x10 meters within the store to run your online shopping service from?

.....

13. If you answered 'no' to question 12, how would you run the service in the space you have available and how much space do you have?

.....

14. Do you have a large enough receiving bay for online delivery trucks?

.....

15. Would you be prepared to provide your own transport for orders if customers were paying for the delivery service or would you rather use an outsourced company?

.....
.....

16. What staff do you think you would have to hire, if any, to run online shopping from your store?

.....

THANK YOU FOR YOUR TIME

PROJECT REPRESENTATIVE:

PIA WALKER

INDUSTRIAL ENGINEERING STUDENT

STELLENBOSCH UNIVERSITY

[TEL: 0846457577](tel:0846457577)

EMAIL: 15324753@SUN.AC.ZA

PLEASE FEEL FREE TO CONTACT ME WITH ANY QUESTIONS OR COMMENTS YOU MAY HAVE.

Appendix E Meeting with Michael Cotterell

Head of online shopping

- 1. Who are the two most successful stores in terms of profit from online shopping?**

No stores currently make a profit but the most efficient and successful is Kenilworth Store

- 2. Where are the Hypermarkets located?**

Ottery and Brackenfell

- 3. Discuss the complexity of adding other Hypermarket items to website for ordering**

The current plan is to move online shopping from the Kenilworth store to the Ottery Hypermarket. All items at the hypermarket will then be available online. Decisions are still being made about whether all items can be ordered in one order or whether non grocery items will have to be ordered and delivered separately.

- 4. Average wage for pickers/manager/truck drivers/other online shopping (in store) staff. (this information will be altered)**

**Information provided cannot be provided as this information is confidential and values were changed for use in this project*

- 5. What staff are needed, how many pickers, etc**

Based on the Kenilworth Store, the current staff structure is as follows:

3x permanent pickers

2x casual pickers

2x packers

1x cashier

1x assistant manager

1x manager

- 6. Discuss, if franchise stores were used, which costs they could be expected to cover and which Pick n Pay would have to cover.**
-

Pick n Pay would not cover their in store costs. This would include set up, staff and transport costs. Some of the current corporate stores have their own vehicles which could be distributed to some franchise stores.

- 7. Has the cost of running the trucks been worked out? If so, roughly how much do they cost per km?**

Information provided although Pick n Pay does not cover these costs as transport is outsourced. Cost of transport can be roughly worked out on the AA website

- 8. How much do one of the delivery vehicles cost?**

The amount paid to the logistics company responsible for the transport for all trucks was provided but is confidential.

- 9. How many are currently available in the Cape Town area and country wide?**

25 vehicles are currently used country wide. 3 at the Kenilworth Store

- 10. What are the set up costs and how much do they each cost?**

Two models for set up:

Type 1: the cheaper version: PC, bins, vehicle/transport,

Type 2: the more expensive but efficient method: PC, bins, vehicle/transport, Handhelds and network for handhelds

- 11. How many orders can a truck hold?**

No answer provided

- 12. How many orders does a truck generally take?**

Stats provided

- 13. Has it been worked out how far a truck travels on average on one round of deliveries?**

Stats provided

Appendix F Meeting with Angelo Clayton**Website**

- 1. How does the website pick up the area you live in and how does it decide if that area is serviced or not?**

Currently all areas are covered by online shopping according to the website. No address will be rejected unless the system cannot find it. When the orders are sent through to the stores the manager may use their discretion and reject orders that are too far from the store.

- 2. Is there a maximum distance on how far the trucks will travel to make a delivery?**

At the moment, no but as mentioned before store owners can reject orders. With the new model there will be a limit put on the website.

- 3. View on implementation of franchise stores?**

- **More stores on system**
- **Lower costs for pick n pay (in store staff, transport, etc)**
- **Shorter travelling distance**
- **More efficient**

It could definitely work and the model provided is very good. Reducing the costs and drawing customers is what needs to be done now. It will however cause Pick n Pay to not make a profit from the service unless it grows bigger than what franchise owners can handle. Also, it will be difficult for management to control the service as all franchise owners will have their own way of doing things. Methods and rules will have to be put in place.

- 4. Is it possible to have the specific store's catalogue available and indication of whether items are available?**

It is possible and is being considered to avoid the high number of out of stocks in orders. The SAP stock take will have to be aligned with mweb who runs our website. The easiest way to probably do this is to send a stock take list to mweb once a day and have a the system cross check the stock take on the stores system with the stock take on the website and make alterations.

- 5. Is it possible for order to be printed out in order of store layout?**
-

This is difficult as all store layouts are different. Especially with the use of franchise stores, it will be difficult and very time consuming to do this for each store and keep it updated.

The best option, if this is to be done, is to give the franchise stores 3 layouts to choose from and using a space tool plan to design the store and where the items are in order for the orders to be printed out in this order.

In my opinion a store should be set up that is not used for anything except online shopping orders (like a distribution centre) where staff can easily move through the store and pick items with no customers around and the store plan will be known by pickers.

- 6. If franchise stores are used, what method can be used to distinguish between online shopping orders and in store customer orders on the system when orders are cashed up for use of online shopping management?**

In the corporate stores this has already been implemented so this could easily be implemented at the franchise stores. The online shopping sales are recorded on the store sales but are distinguished from in store customer orders on the system.

- 7. Would it be possible to have an option at check out of including the delivery fee?**

Yes, has already been implemented at corporate stores, it goes through as another item in the order

Appendix G	Meeting with Deon Saayman
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Franchise Store owner (Stable Square)

- How does the Online shopping service you offer work?
 - Website
 - Methods
 - Whole process
 - Transport method- vehicle (petrol or diesel) and strength of engine
 - Special fridge???

The store does not have a website, orders are emailed or faxed (see appendix 8). Orders have to be sent to the store before 11am and will be delivered the same day. Once the order is received, it is printed and given to the floor manager. He then gives it to one of the staff members and they pick the order. The order is then rung up and packed into bags and the bags are packed into a trolley. The trolley is stores in the front of the store until it is time to deliver it. The order is then taken to the store owner's car (Toyota Fortune) and he delivers the order to the customer. If the store does not have an item that the customer has ordered, the franchise owner will go to Canal Walk and purchase the item from another store. The franchise owner is prepared to go to extra lengths to ensure the customer is satisfied with the service. In one incident an office was having a staff braai and ordered all their items from Stable Square. They needed an extra braai so the store owner provided them with his own personal braai to use for the event. (See the thank you note in Appendix 9). If the orders are big enough the store owner is prepared to travel far distances to deliver it. Home shoppers are billed once a month as they are mainly businesses. If the service was to increase its customer density, customers would be billed immediately as the owner did have one problem with a household order where he struggled to receive payment.

- Fill in questionnaire

Not yet received

- How many orders
 - Mainly companies or private homes?

Mainly companies. It increases the stores revenue by about R40 000 a month and this is why the store owner is prepared to go the extra mile for the customers.

- Do you think my model will work i.e. moving online shopping to franchise stores?
-

Absolutely. Franchise owners will be happy to take on this service as it can increase their customer density and revenue by quite a large amount. Franchise owners are also more passionate as it is their store and they want to make a success of it. They will make a plan to make the service work, whether they have a lot of available space or not.

Appendix H	Examples of Home Shopping Orders at Stable Square
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HENRY TAYLER & RIES LTD

Date: 12th February 2009 **Requestor:** Donna Louw
Attention: Deon Saayman **Company:** Pick 'n Pay, Sable Square
Position: Manager **Vendor No:** 117535

Purchase Order No:

Product	Size	Price of Item	Quantity	TOTAL COST
Sugar	2 kg	15.99	1	15.99
Nescafe Coffee	200g bottle	47.99	1	47.99
Hot Chocolate (Nescafe brand)	1kg Tin	55.99	1	55.99
Brown Bread	1 Loaf	6.29	2	12.58
Coke	2 Lt	11.69	2	23.38
Coke Zero	2 Lt	11.69	2	23.38
Fanta Zero	2 Lt	13.99	2	27.98
Peanuts & Raisins	1 kg packet	18.99	1	18.99
NikNak Chips	1 packet	7.69	4	30.76
Romany Creams	1 box	13.99	4	55.96
Lemon Creams	1 packet	6.99	3	20.97
Mixed Biscuits	1 kg box	64.99	2	129.98
Mayonnaise (C&B Brand)	1 bottle	19.99	1	19.99
Tomato Sauce	1 bottle	12.29	1	12.29
Box of Tissues	2 ply	16.99	2	33.98
Bovril Spread	1 bottle	26.99	1	26.99
				0.00
				0.00
TOTAL				557.20

Delivery Address:

Henry Tayler & Ries Ltd
Unit M1 Centurion Business Park, Democracy Way, Milnerton 7441

Deon Saayman

From: Philip Cook <PhilipC@hotelschool.co.za>
Sent: 23 August 2011 01:01 PM
To: Deon Saayman
Subject: Order for Thursday

Hi Deon

Can I please order the following ingredients for Thursday, this is for the 2nd years final exam so it is a bit of a mixture

1 plain goat's cheese
100gr small block parmesan
1 tub Crème fraiche
1x 500ml plain yoghurt
1 Tub Smooth Cream Cheese
1x 250ml sour cream
100g Pecans
1 jar black olives
1 box Orange jelly
1 Bottle Red wine cheap
1 bottle cheap white wine
500g chicken livers
1 French loaf
200g raw bread dough
4x 500g butter
1 bottle cheap sparkling wine
1 tub frozen mixed berries
2x100g milk chocolate
1x 100g peppermint crisp
5 croissants
1 box Maizena
1 packet Poppadoms
2 punnets strawberries
2 cups blueberries
1 tin peach halves
2 green pears
4 Bananas
2xGreen pepper
2xYellow pepper
2xRed pepper
1 Cauliflower
2 Green Apples
1kg carrots
1 Bag mixed salad leaves
1 Bag Baby Leaves
1 pack rocket
1 punnet dill
1 punnet rosemary
1 punnet cherry tomatoes
500g tomatoes
4 Oranges
2 kg onions
1kg red onions

Thanks

Regards

**PHILIP COOK
CULINARY LECTURER
INTERNATIONAL HOTEL SCHOOL (PTY) LTD
CAPE TOWN CAMPUS**

Tel + 27 21-555-6000
Fax + 27 21 555 6020
e-mail philipc@hotelschool.co.za
web www.hotelschool.co.za



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Babbel en Krabbel se maandelikse bestelling:

Mieliepap 2.5kg x3

Weetbix 72 per boks x4

Matabella x4

Oats x5

Visvingers 32 per boks x 12

Macaroni x 8kg

Spagettig x 4kg

Koekmeel 2.5kg x2

Boelie Beef x 8 blikke

Rys 15kg

Today's sausage rolls 30 per boks x6

Olie (nie Crown!!) 2l x5

Bisto en Bisto hoender 2 groot bokse elk

Muchroom sop x4

Wit uie sop x4

Enige 8 pakkies hoender *cook in sous* (behalwe *sweet and sour*)

Tamatiesous 7bottels

Chutney 1x groot pot

Vlapoeier 1x groot blik

Jelly verskeidenheid 12 pakkies

Gesnyde ingelegde perskes 6 groot blikke

Beskuit karringmelk x 4 bokse

Koekies 6 pakkies elk vanilla, sjokolade en aarbei (Toppers)
Sout x 2kg
Hervul groot bokse: kerrie, borrie x1 hoender, steak en chop en swartpeper x2
Koffie 6 groot blikke (Ricoffy)
Rooibostee 80 sakkies
Engelse tee 200 sakkies (Vyf rose of Joko)
Suiker 50 kg
Bakpoeier (groot blik)
Koeldrank aanmaak verskeidenheid geure x 15 bottels (1 bottel maak 11 liter)
Konfyt 2 groot blikke elk fyn appelkoos en gemengde vrugte (tronk jam)
Bovril x2 groot potte
Vissmeer x 4 groot potte
Grondboontjebotter 2x 1kg emmertjie No name fyn
Stroop 1 x groot bottel
Margarine 1.5kg x 10 bakke
Aartappels 2 sakke 10kg
Wortels 6kg
Beet, gerasper 9 groot bottels
Lugverfrisser x 5 blikke
Handdoekrolle x 3
Wet wipes 72 per pak x 16
Swartsakke 50
Sponsies x3
Opwasvadoeke 2

Appendix I **Thank you letter from Stable Square
Home Shopping customer**

Deon Saayman

From: Linda Jacobs <Linda.Jacobs@S1.com>
Sent: 09 September 2011 01:00 PM
To: 'WP Family Sable Square Email'
Cc: 'Charles Carolus'; 'dsaayman@mweb.co.za'
Subject: RE: Home shopping for Postilion

Thank you Pick n Pay Sable Square for the excellent Boerewors you provided us with today.

It was just right (even better) and was enjoyed by All. My function was a great success.

Thank you Shafiek too.

Much appreciated

Linda Jacobs
Office / Facilities issues
S1

From: Linda Jacobs
Sent: 01 September 2011 04:08 PM
To: 'WP Family Sable Square Email'
Cc: 'Charles Carolus'; 'dsaayman@mweb.co.za'
Subject: RE: Home shopping for Postilion

Good day Charles/ Shafiek/ Deon

Please send me some cookies tomorrow as well.

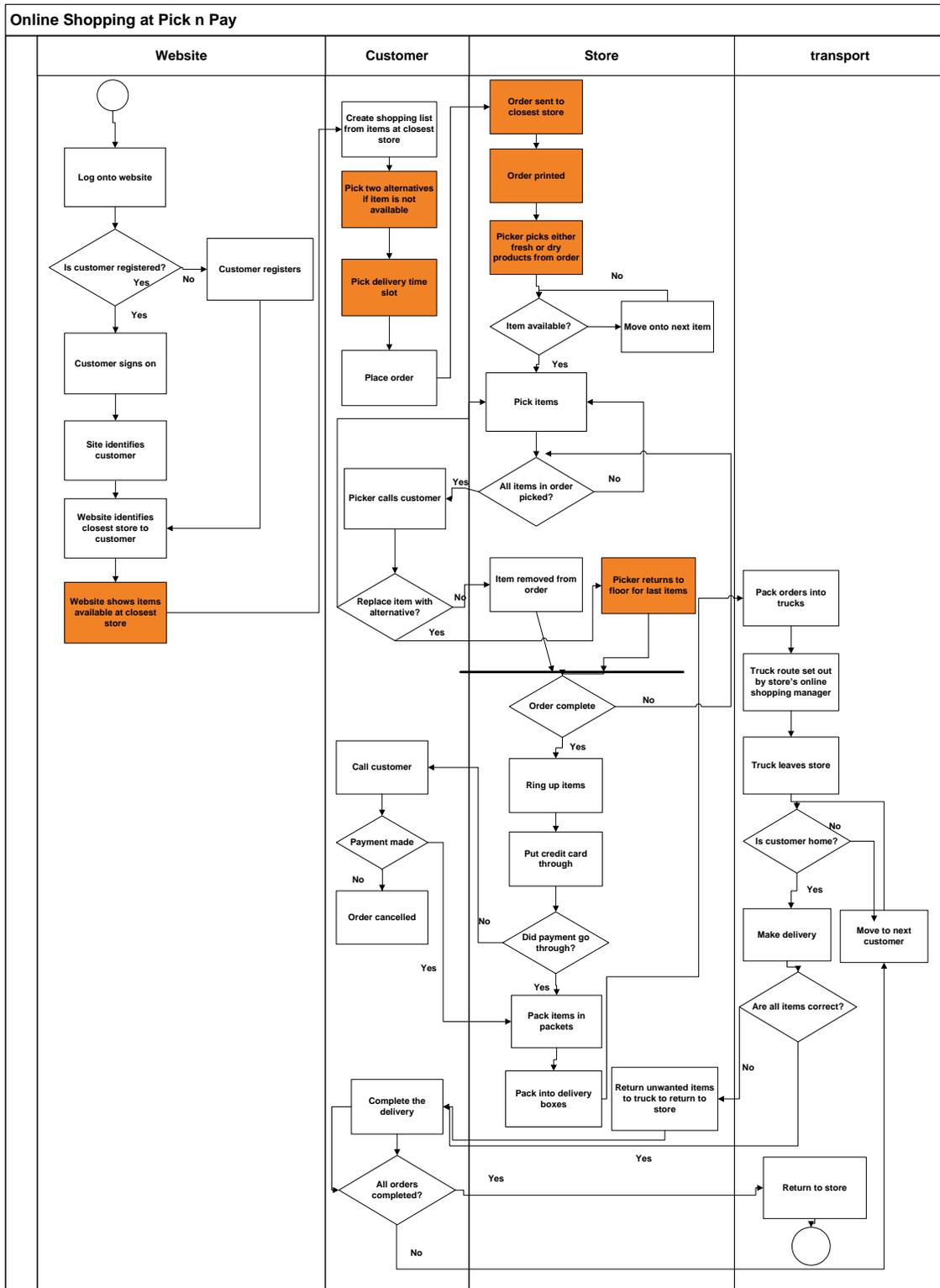
3 packets whirls
3 packets eet sum more biscuits
3 packets Jolly jammers
3 2 packets Romany creams

Thank you

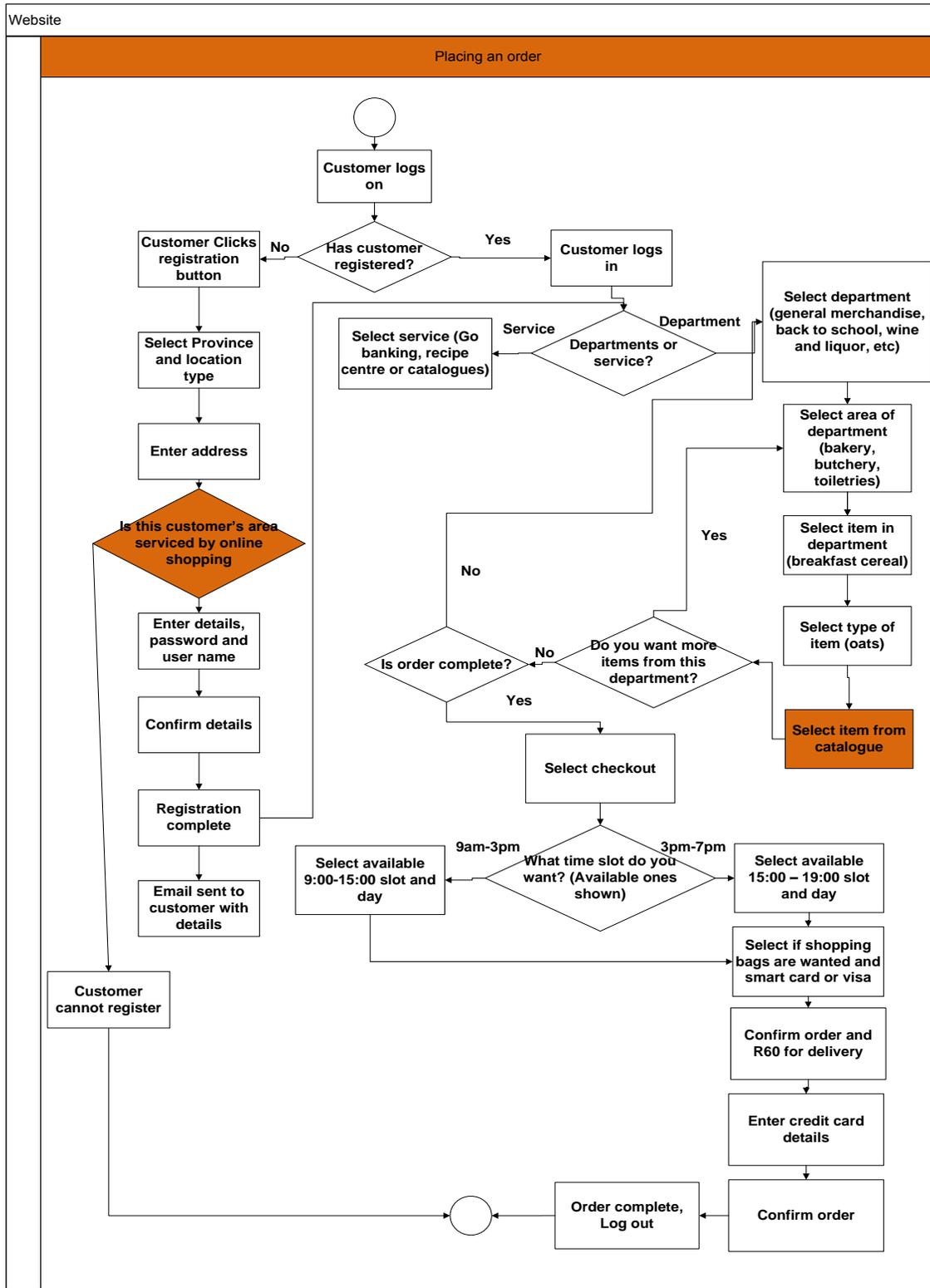
Kind regards,

Linda Jacobs

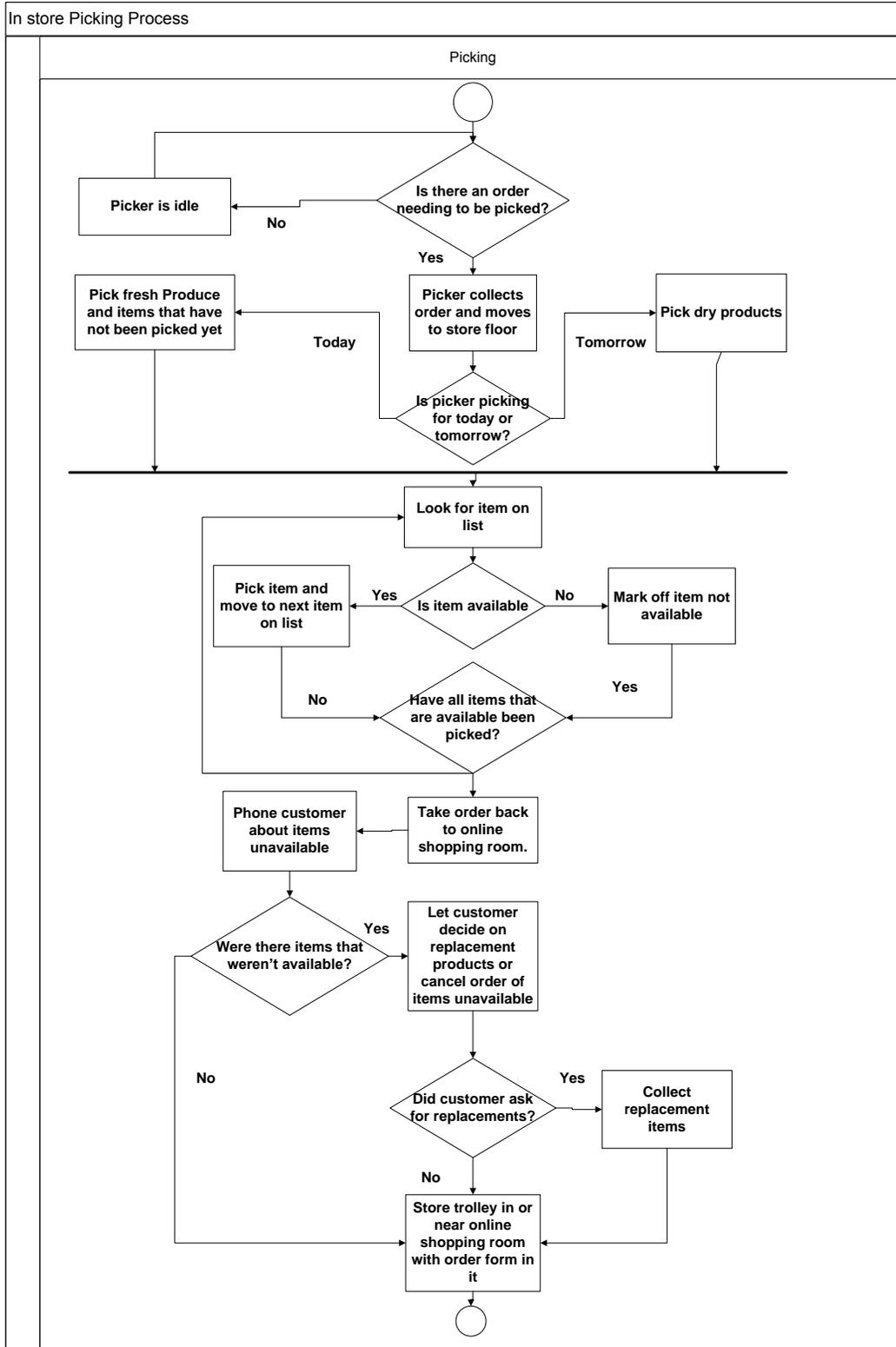
Appendix J *Flow Diagram of the online shopping process*



Appendix K Flow Diagram of placing an order



Appendix L Flow diagram of picking process



***Appendix M Outsourced
transportation to
logistics company
Analysis***

Dimension of delivery trucks:

<u>Truck Dimensions:</u>	Toyota D-4 D	Nissan dCi120
Height	1.65	2
Width	1.82	1.85
Length	3.6	3.16

Dimensions of delivery bins:

<u>Bin Dimensions:</u>	
Height	0.43
Width	0.48
Length	0.65

No. of bins that can fit in a truck:

<u>Best fit for bins in truck</u>	Toyota D-4 D	Nissan dCi120
height of truck/height of bin	3.8372093	4.651163
Width truck/(W+L+L of bin) i.e 3 bins	1.02247191	1.039326
Length of truck/length of bin	5.53846154	4.861538
Length of truck/ width of bin	7.5	6.583333
Maximum number of bins in vehicles	57	64

Cost of running a vehicle according to AA standards (AA, 2011):

<u>Costs of running vehicles</u>	Toyota D-4 D	Nissan dCi120
AA - Fuel factor	11.18	11.18
AA- Maintenance cost (c/km)	23.696	23.696
AA- Tyre Cost (c/km)	12.896	12.896
Diesel Price	7.32	7.32
Total cost (c/km)	118.4296	118.4296
Total cost (R/km)	1.184296	1.184296

Kenilworth: Utilisation of trucks, average km/order and cost of delivering an order:

<u>Analysis for Kenilworth</u>	Toyota D-4 D	Nissan dCi120
Average current no. of bins per order:	2.87	
Average current no. of bins per trip:	18.84	
Average no. of orders per trip	6.56445993	
No. of orders possible per truck:	19.8606272	22.29965
Current utilisation of trucks:	33.05%	29.44%
Average current Km/order (truck type not considered)	9.98	
Cost of delivery of order (According to AA)	11.8192741	

Whole Country: utilisation of trucks, average km/order and cost of delivering an order:

<u>Analysis for whole Country</u>	Toyota D-4 D	Nissan dCi120
Average current no. of bins per order:	5.79	
Average current no. of bins per trip:	34.51	
Average current no. of orders per truck	5.96027634	
No. of orders possible per truck:	9.84455959	11.0535
Current utilisation of trucks:	60.54%	53.92%
Average current Km/order: (truck type not considered)	13.05	
Cost of delivery of order (According to AA)	15.4550628	

Kenilworth: % of cost covered by the charged delivery fee:

<u>Kenilworth</u>	
Cost of each vehicle/month	44797.408
Cost of vehicle hire/order	152.5450897
Vehicle running cost of delivery of one order	11.81927408
Total cost of delivering an order	164.3643638
Delivery fee	60
% of cost covered by delivery fee:	36.50%

Whole Country: % of cost covered by the charged delivery fee:

<u>Whole country</u>	
Cost of all vehicles/month	1119935.2
Cost of vehicle hire/order	174.1463536
Vehicle running cost of delivery of one order	15.4550628
Total cost of delivering an order	189.6014164
Delivery fee	60
% of cost covered by delivery fee:	31.65%

Appendix M Letter from Online shopping manager at Rondebosch Franchise Store

Hi Pia

Further to your survey re 'On Line Shopping' I manage the Homeshopping Dept and have done so for the past 12 years since we became franchise holders, my husband is one of the partners and I became involved in the store. We do not use online shopping via e.mail but use fax and direct phoning from our customers. I find the personal touch is better and we do same or next day deliveries. I have two High Ace Vans with drivers and caddies and four staff who shop and ring up the orders including myself.

We supply caterers (one of whom is the largest caterer to the movie industry in the western cape) and also U.C.T. and their various satellite depts..

We also supply many large companies in the area who buy their weekly and monthly groceries from us. We also provide a catering service for these customers.

One of the benefits we offer is that we run accounts on a weekly and two weekly basis .

We also have many private customers whom we service.

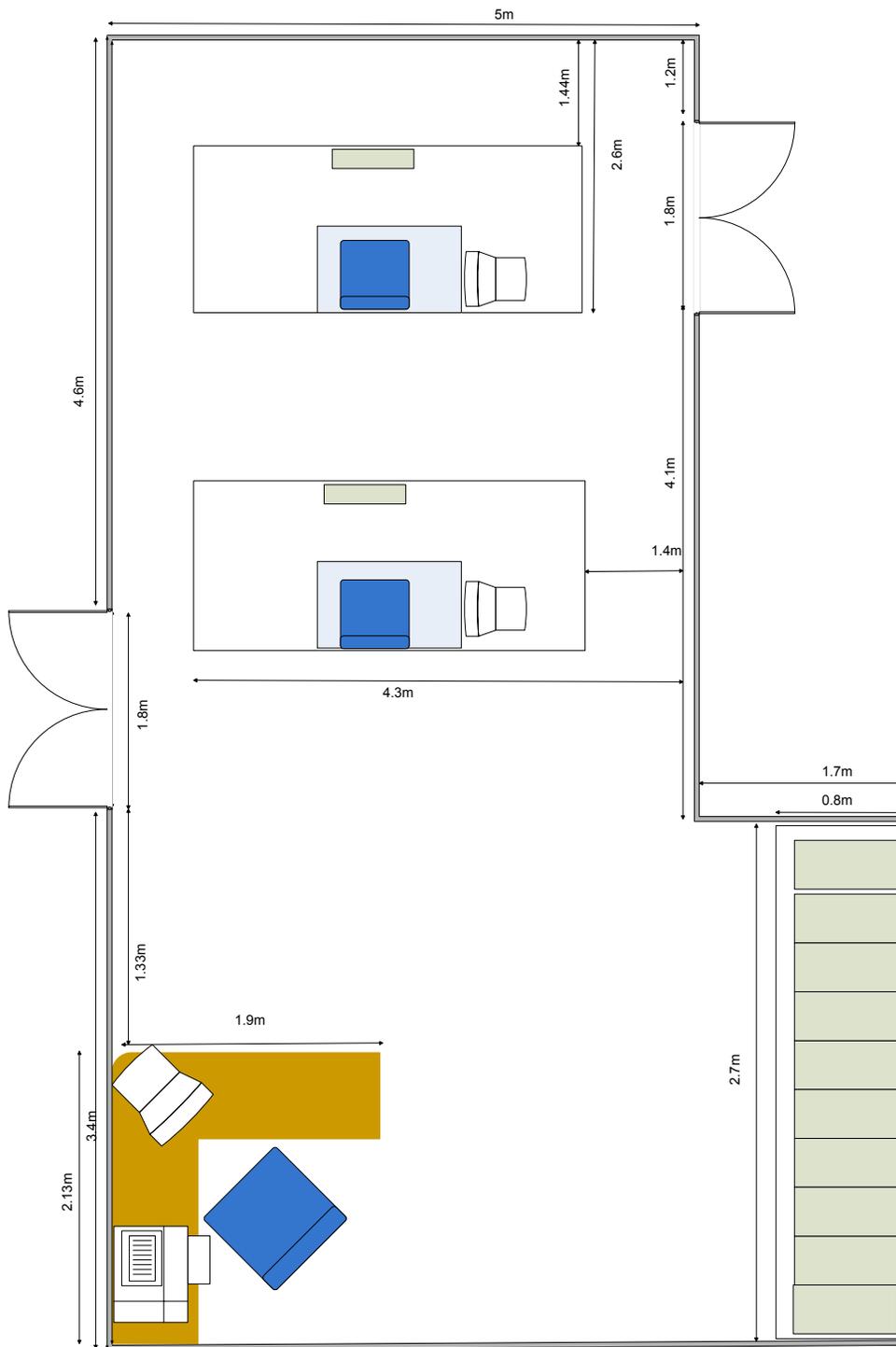
If you need to speak to me for any further info please do not hesitate to contact me on my cell at 082 371 3260 and I will be pleased to help you.

Good luck with your research.

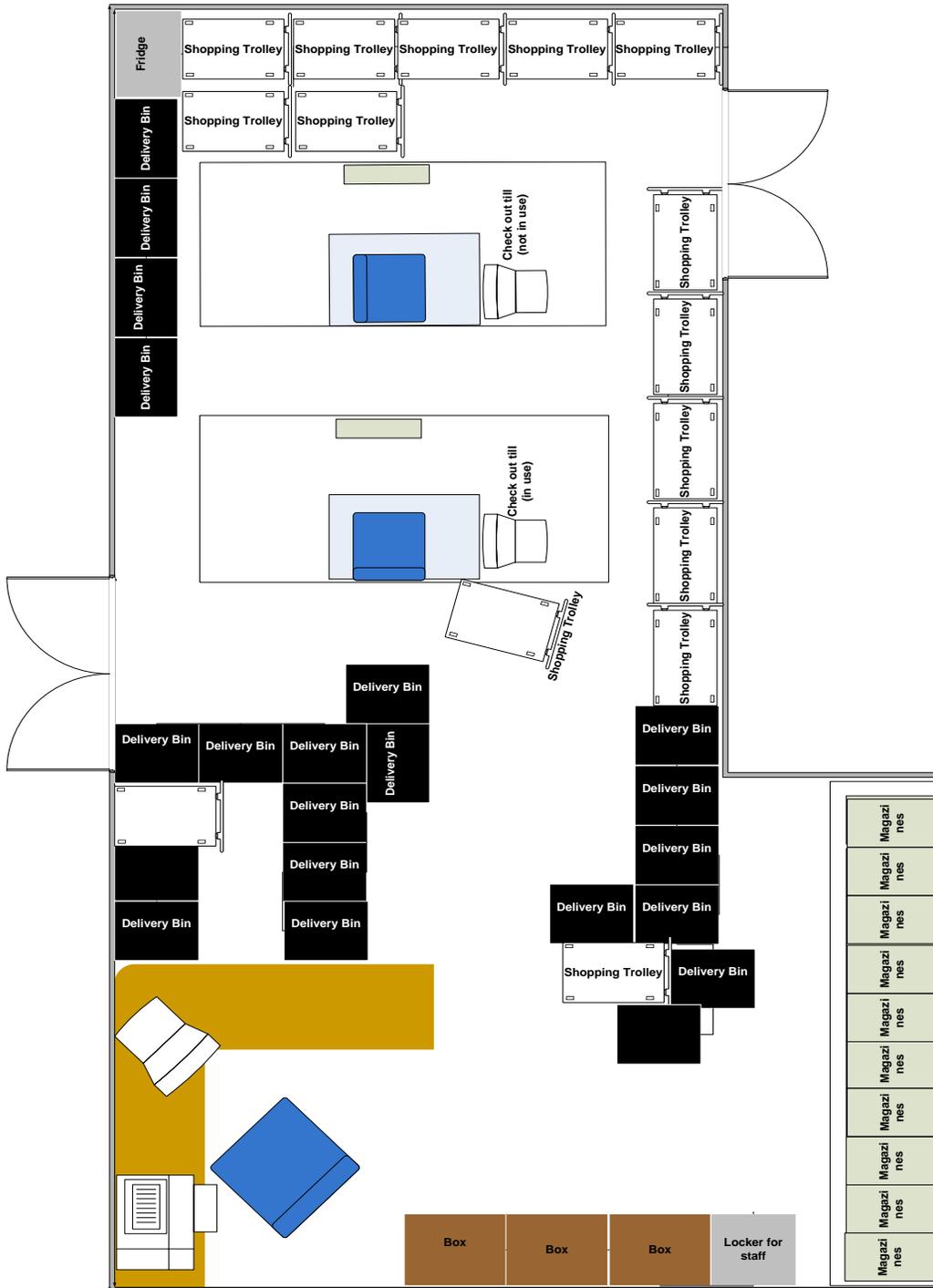
Mimi Winkler

Homeshopping Dept.

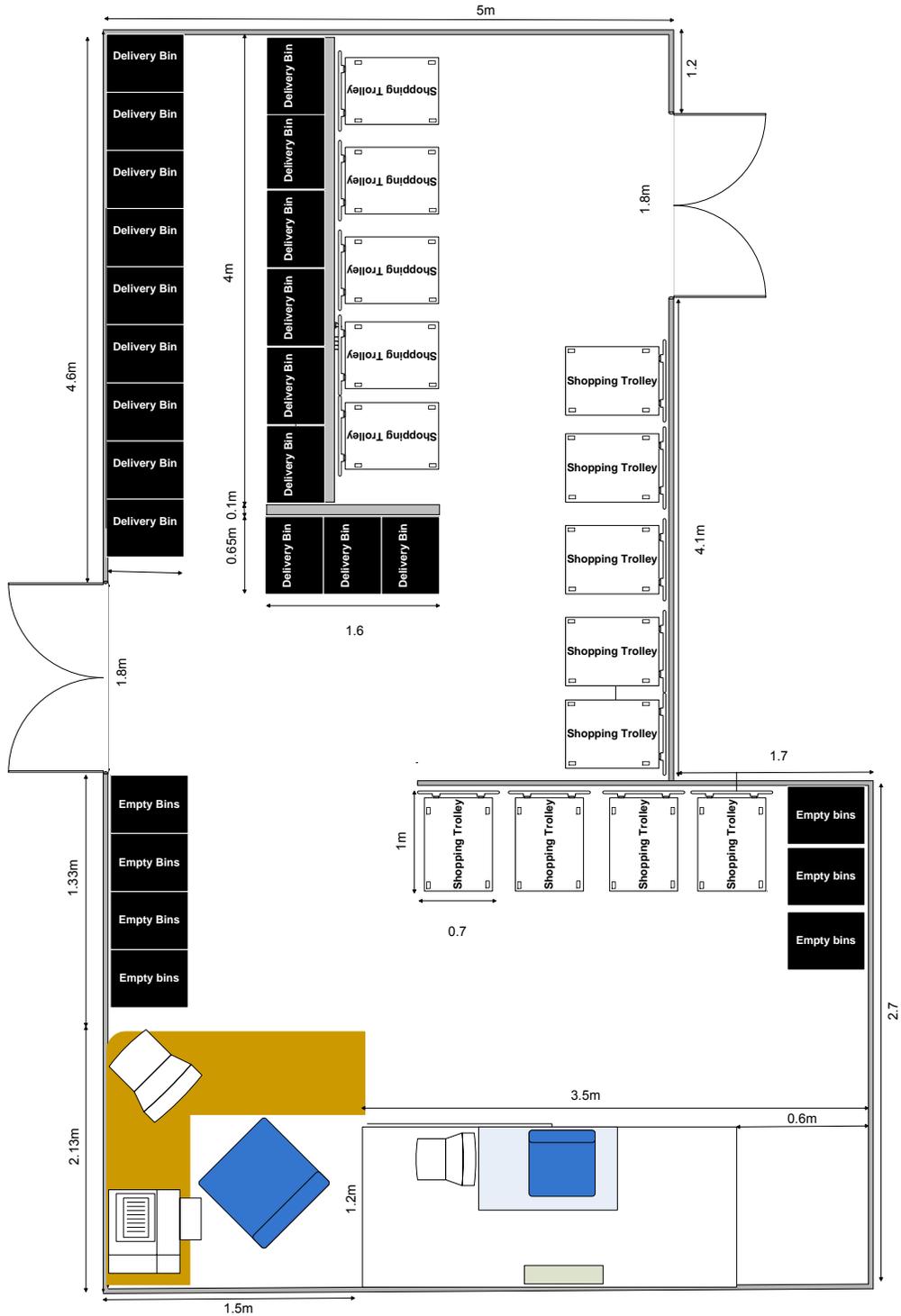
Appendix N *Dimensions of online shopping room at Kenilworth Store*



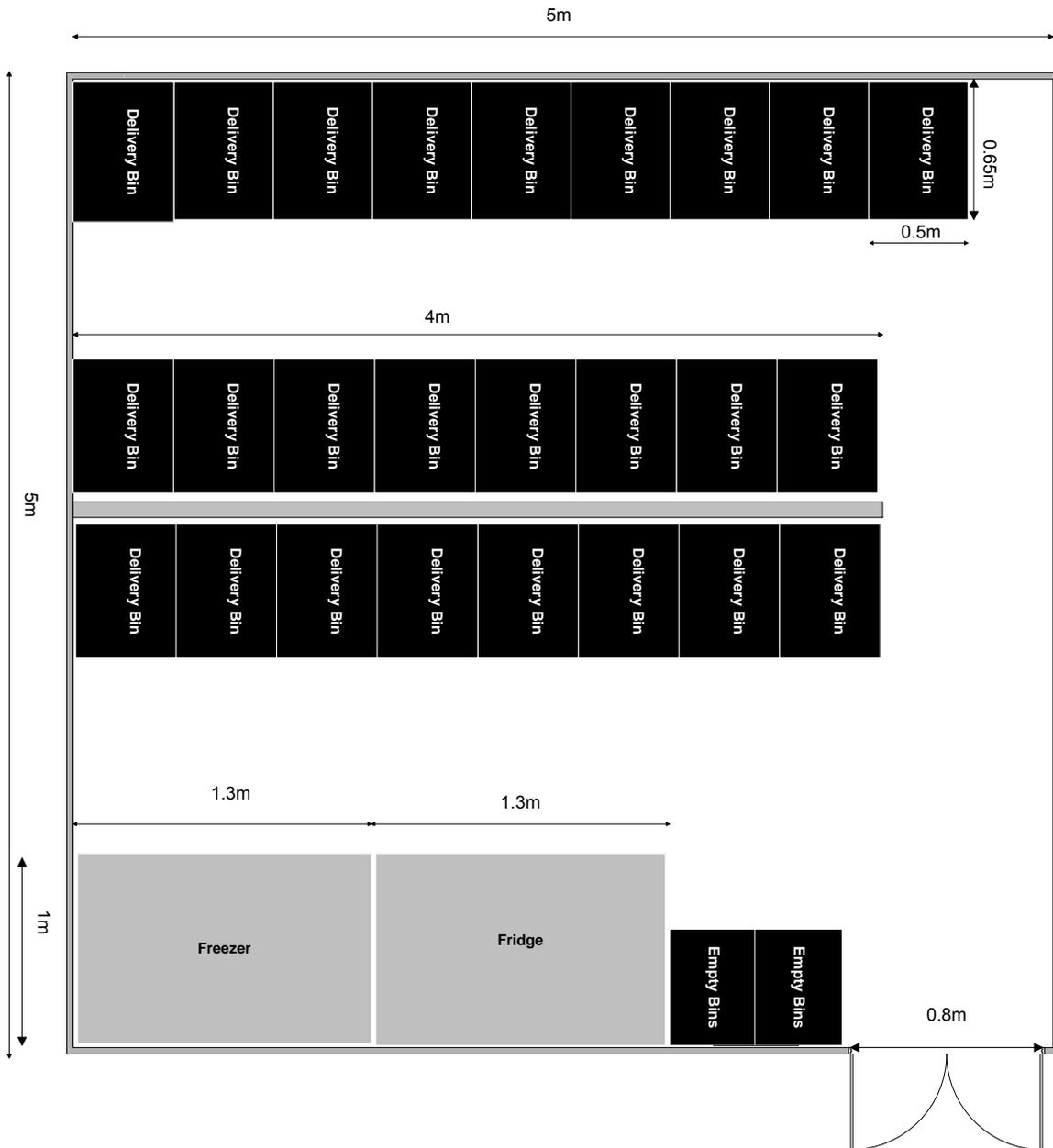
Appendix O Current Layout of room during operation



Appendix P Proposed layout at Kenilworth Store



Appendix Q *Recommended layout of online shopping room at franchise stores*



Appendix R Analysis of active customers' distance from the kenilworth Store

area	no of customers	distance from store	total distance
Alphen	1	5	5
Athlone	5	7	35
Bantry Bay	2	20	40
Bergvleit	1	7	7
Bishopscourt	2	7	14
Camps Bay	5	20	100
City Centre	8	13	104
Claremont	13	3	39
Clifton	3	19	57
Constantia	2	10	20
De Waterkant	2	14	28
Dreyersdal	2	9	18

Fresnaye	3	19	57
Gardens	7	13	91
Goodwood	4	15	60
Grassy park	2	7	14
Green Point	3	16	48
Hout Bay	3	11	33
Kenilworth	8		0
Kensington	3	14	42
Kommetjie	1	30	30
Lagoon Beach	1	15	15
Matroosfontein	3	17	51
Mitchells Plain	3	17	51
Mouille Point	3	18	54
Mowbray	5	8	40

Muizenberg	3	15	45
Newlands	4	6	24
Noordhoek	3	25	75
Observatory	5	8	40
Ottery	2	8	16
pinelands	3	8	24
Plumstead	3	5	15
Romp Vlei	1	3	3
Rondebosch	9	6	54
Rosebank	1	13	13
Rugby	3	13	39
Scarborough	1	36	36
Sea Point	7	18	126
Silverhurst	2	8	16

Sunlands	1	4	4
Tamboerskloof	2	15	30
Tokai	1	12	12
Vredehoek	1	12	12
Woodstock	2	11	22
Wynberg	3	3	9
Zonnebloem	2	12	24
50	160		1776
		average distance	11.1
