CUSTOMIZING ROUTE-TO-CONSUMER STRATEGIES TO COST EFFECTIVELY IMPROVE SERVICE LEVELS TO VARIOUS CUSTOMER CHANNELS

by

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Executive Summary

"Logic will get you from A to B. Imagination will take you everywhere."

Albert Einstein (1879 - 1955)

NOBEL PRIZE – WINNING PHYSICIST

Companies have a lot more potential to be profitable when accurately understanding logistics activity costs. This can be achieved through cost savings by developing Route-to-Consumer strategies with a Cost-to-Serve analysis study; altering the secondary distribution system by applying the correct customer channel/segment service packages.

The topic entails producing a conceptual model to service IMPERIAL Distribution's (ID) client's customers in order to achieve cuts in redundant logistic expenditures whilst improving service levels.

Initiating, then working on, and for ID to possibly implement preliminary stages of this conceptual model will happen within the final year project timeframe. Considerations include customer service requirements, reverse logistics, product characteristics, vehicle configuration and region disposition.

The project outcomes should be aligned with sales and commercial models and therefore not seen in isolation, but as a holistic supply chain solution. The venture will seek to perfectly balance logistic operating constraints and customer service levels.

In essence the intended project solution will be done within the Industrial Engineering Departments' capacity and the possible structure implementation through ID. The project will mainly focus on outbound logistics, including activities and cost associated with primary and secondary distribution.

The best initial approach to take when looking at Route-to-Consumer initiatives is to explore the logistic base costs found in an organisations' income statements and balance sheets discussed under the Cost-to-Serve section. It is required to observe the cost allocations of secondary distribution (various customer channels) to critically analyse where possible areas for improvements might be.

Until recently the pressure on management existed to concentrate on total cost reductions without thinking it might influence areas that does not need savings; Cost-to-Serve (CTS) modelling identifies the improvement opportunities related to logistic service costs.

A Cost-to-Serve (CTS) modelling analysis regarding Route-to-Consumer (RTC) strategies will form the base to determine the business case for potential change. Taking the current operations of the client into account; the Route-to-Consumer strategy will be formulated based on the agreed service requirements by each of these channels.

The Fast Moving Consumer Goods (FMCG) industry partner being studied deals with both national manufacturing and international imports of product. IMPERIAL Distribution has the responsibility of providing logistic services on behalf of the client and further implementing improvement Route-to-Consumer strategies.

The question is what kind of service package along with the type of distribution system should be dedicated to a specific customer channel and region in order for the client and the Logistic Service Provider (LSP) to be more profitable or gain equal benefit?

Cost-to-Serve modelling indicates which customers are beneath a profitable margin and should be altered in order to elevate said customer to a more favourable position.

Bestuursopsomming

Maatskappye het baie meer potensiaal om winsgewend te wees wanneer logistieke aktiwiteits kostes beter verstaan word. Dit kan bereik word deur koste besparings met die ontwikkeling van “Route-to-Consumer” strategieë deur 'n “Cost-to-Serve“ ontleding studie; wysiging van die sekondêre verspreiding stelsel deur die toepassing van korrekte kliënt kanaal/segment diens pakkette.

Die onderwerp behels die vervaardiging van 'n konseptuele model om IMPERIAL Distribution se kliënte te bedien ten einde sny in onnodige logistieke uitgawes te bereik, terwyl die verbetering van diensvlakke vir IMPERIAL Distribution (ID) plaasvind.

Inleiding, werk en vir ID om voorlopige stadiums van hierdie konseptuele model in werking te stel sal gebeur binne die finale jaar projek tydperk. Oorwegings sluit in; kliënte diens vereistes, omkeer logistiek, produk eienskappe, voertuig opset en streek ingesteldheid.

Die projek uitkomstes moet ooreenstem met verkope asook kommersiële modelle en daarom moet dit nie in isolasie gesien word nie, maar as 'n holistiese voorsienings-ketting oplossing. Dié onderneming sal poog om perfekte balans tussen logistieke operasie beperkings en kliëntediens vlakke te handaf.

In wese sal die bedoellende projek oplossing gedoen word binne bereik van die Bedrys- en Sisteems Ingenieurswese Departement aan die Universiteit van Pretoria en die voorgestelde struktuur implementering deur ID. Die projek fokus hoofsaaklik op uitgaande logistiek, insluitende aktiwiteite en kostes verbonde aan primêre en sekondêre verspreiding.

Die beste aanvanklike benadering om te neem wanneer na “Route-to-Consumer” inisiatiewe gekyk word is die ondersoek in logistieke basis kostes wat in 'n organisasie se inkomstestate en balansstate is; bespreek onder die “Cost-to-Serve” artikel afdeling. Dit is nodig om die koste toekennings van sekondêre verspreiding (verskeie kliënte kanale) in ag te neem om krities te ontleed waar moontlike areas vir verbetering kan wees.

Tot onlangs het daar druk op bestuur bestaan om te konsentreer op die universële vermindering van uitgawes, sonder om te dink dat dit dalk ‘n invloed sal hê op gebiede wat nie eintlik besparings nodig het nie; “Cost-to-Serve” modellering identifiseer die verbeterings geleenthede verwant aan logistieke diens kostes.

“Cost-to-Serve” (CTS) modellering met betrekking tot “Route-to-Consumer” (RTC) strategieë sal die basis vorm vir die besigheids geval om moontlike veranderings te bepaal. Dit neem die huidige werksaamhede van die kliënt in ag; dié “Route-to-Consumer” strategie sal geformuleer word op grond van die ooreengekome diens vereistes deur elk van die verskaffings kanale.

Die “Fast Moving Consumer Goods” (FMCG) bedryfs vennoot wat bestudeer word handel met beide nasionale vervaardiging sowel as die internasionale invoer van produk. IMPERIAL Distribution het die verantwoordelikheid om verskaffing van logistieke dienste namens dié kliënt te doen en om verder ook die verbetering van “Route-to-Consumer” strategieë uit te voer.

Die vraag kom neer op watter soort diens pakket, saam met die aard van die verspreiding stelsel, toegewy moet word aan 'n spesifieke kliënte kanaal en streek om vir dié kliënt en “Logistieke Diens Verskaffer” (LSP) meer winsgewend te maak en/of om gelyke voordeel te trek?

“Cost-to-Serve” modellering dui kliënte aan wat onder 'n winsgewende grens verkeer en verduidelik wat gedoen moet word ten einde dié kliënt na 'n meer gunstige posisie te verplaas.

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3PL:	Third-party Logistics Provider
CDC:	Centralised Distribution Centre
CJ:	Consumption Junction
CRM:	Customer Relationship Management
CTS:	Cost-to-Serve
DC:	Distribution Centre
ERP:	Enterprise Resource Planning
FMCG:	Fast Moving Consumer Goods
ID:	IMPERIAL Distribution
IE:	Industrial Engineering
IL:	IMPERIAL Logistics
JSE:	Johannesburg Stock Exchange
KPI:	Key Performance Indicators
LSP:	Logistics Service Provider
NDD:	Nominated Delivery Day
QR:	Quick Response
RFI:	Request for Information
RTC:	Route-to-Consumer
SAP:	Systems Analysis and Processes
SKU:	Stock Keeping Unit

1. Introduction

Companies have a lot more potential to be profitable when accurately understanding logistics activity costs. This can be achieved through cost savings by developing Route-to-Consumer strategies with a Cost-to-Serve analysis study; altering the secondary distribution system by applying the correct customer channel/segment service packages.

1.1. Project Definitions

For the purpose of clarity throughout this paper a list of defined terms has been created in order for the reading to be consistent. Table 1 contains the recurrent terms used in this project:

Table 1: Table of Project Definitions

Term	Definition/Description
Fast Moving Consumer Goods (FMCG)	The FMCG industry operates with consumer items that are usually produced in large quantities and turnover rates for these products are relatively quick. FMCG companies provide these consumable products to the customer through certain predetermined distribution channels/segments.
Client	Referring to the CLIENT, within the capacity of this project, means the client of IMPERIAL Distribution (ID) which requires the dedicated logistic services of ID.
Customer	The term CUSTOMER denotes to the final designated location where delivery takes place. These customers are grouped together via the assigned customer channels/segments.
Primary Distribution	Inbound logistics that takes place in larger capacities and operates as an entity between the manufacturing sites and/or warehouses in the form of inter-warehouse transportation.
Secondary Distribution	Outbound logistics that takes place in smaller capacities and operates as an entity between the depots and final customer destinations. Therefore, customer interfaces needs to be considered with this transportation activity.
Depots/Warehouses	Storage locations of the consumer products; property assets either provided by ID or owned/rented by the FMCG company.
Route-to-Consumer	The way in which the secondary distribution system is structured in order to provide the customer with products; viewed from a logistic service component.
Cost-to-Serve	Technique used to determine what the logistic activity costs entail in servicing a certain customer channel or segment; measured against the profitability of said channel/segment.

1.2. Company Background

This project is initiated by IMPERIAL Distribution (ID); an operating company that forms part of the consumer products division of IMPERIAL Logistics (IL). IMPERIAL Distribution is a logistics service provider (LSP), providing dedicated logistics solutions to a vast variety of clients.

1.2.1. IMPERIAL Group

IMPERIAL Holdings (Pty) Ltd. is listed under the Industrial Transportation sector of the Johannesburg Stock Exchange (JSE); this is an enterprise that operates in a wide variety of business areas including IMPERIAL Logistics. The key organisations that are involved with this project are shown in the corporate structure as in Figure 1:

Figure 1: IMPERIAL Holdings' Corporate Structure

(Imperial Logistics 2010)

1.2.2. IMPERIAL Logistics

"IMPERIAL Logistics is the leading logistics and supply chain management service provider in Southern Africa with an extensive footprint in Europe. Home to more than 70 Operating Companies in Southern Africa, IMPERIAL Logistics has approximately 17 000 employees, 5 500 vehicles, manages and operates an additional 2 000 vehicles through sub-contractors and warehouse capacity of more than 711 000m^2. IMPERIAL Logistics is one of three divisions within the IMPERIAL Holdings Group." (Imperial Logistics 2010)

"IMPERIAL Logistics provides integrated logistics and supply chain solutions to blue-chip customers in almost all industries, with the IMPERIAL Logistics Consumer Products Division focused on service delivery to the FMCG and retail industries as well as the agriculture and furniture markets. The division distributes into top-end retail, mid-market trade and smaller retail environments, offering primary and secondary transportation, refrigerated and multi temperature transportation of food, express distribution of food and goods as well as selling and merchandising services." (Imperial Logistics 2010)

1.2.3. IMPERIAL Distribution

IMPERIAL Distribution (ID) is an operating company as part of the IMPERIAL Logistics Consumer Products division, providing customers with cost effective logistics solutions.

Although, "ID is more than just a logistics company, by combining processes and technology together with our specialised enablement team; we will find the optimum solution for our clients as well as strive to reduce costs and develop innovative solutions." (Imperial Distribution 2010)

"Imperial Distribution is a division of Imperial Logistics which is a wholly-owned subsidiary of Imperial Holdings Limited. Imperial Distribution was the 3rd established operating company of Imperial Logistics and has been in operation since 1978. We specialise in providing dedicated logistics solutions for our customers, allowing us to be a true supply chain partner." (Imperial Distribution 2010)

"What really set IMPERIAL Distribution apart from others are not our tailored solutions, our technical infrastructure, and our cost conscious approach to business, but our people. IMPERIAL Distribution currently operates around 80 logistic contracts, with our annual turnover approaching the R600mil mark. We own a fleet in excess 650 vehicles, manage more than 100,000m² of warehousing, and employ approximately 1800 people. Our head office is based in Spartan, Kempton Park with regional offices in Cape Town, Durban and Port Elizabeth. We also have operational representation in Nelspruit, Bloemfontein and East London. Relationships, energy and passion for service excellence are what drive our people and we show our pride in the way we go about serving our customers." (Imperial Distribution 2010)

ID's ideology is to position itself as a world-class supply chain partner, and therefore realised the importance to drive sustainable business improvement.

1.2.4. Volition

The project is launched and will be managed by ID with additional assistance from Volition Consulting Services; knowledgeable in supply chain process design.

1.2.5. FMCG Company Support

The project will be supported by one of ID's existing clients in the Fast Moving Consumer Goods (FMCG) industry, with the key purpose to verify the proposed solution with the information available.

This real-world scenario will provide the opportunity to apply graduate industrial engineering skills, along with professional assistance from all stakeholders involved.

1.3. Project Aim

The project requires producing a conceptual model to service ID's client's customers in order to achieve cuts in redundant logistic expenditures whilst improving service levels for IMPERIAL Distribution; being a logistics service provider (LSP) managing fleet and warehouses. Initiating, then

working on, and for ID to possibly implement preliminary stages of this standard model encompasses the goals of this final year project and requires a number of analytical abilities as well as operational research.

"The aim is to develop customized Route-to-Consumer strategies; service packages dedicated to the various customer channels to improve service levels whilst considering the most cost effective approach. The model will be tested by applying, or even implementing, the suggested solution at one of ID's existing clients. The project requires IE qualitative & quantitative techniques in order to find the best solution between minimizing Cost-to-Serve amounts vs. maximizing service levels." (Imperial Distribution 2010)

In a complex trading environment, outbound logistics amounts to considerable costs compared to a products' sales value. ID therefore recognised the need to investigate Route-to-Consumer strategies to find the optimal logistics solution across the various channels, regions, products and customer segment combinations.

1.3.1. Problem Definition

The project requires providing specific logistic solutions for ID's clients – having erratic forecast patterns and different secondary distribution systems – supplying products to their customer channels/segments; each in a particular manner. The existing distribution network (i.e. number of depots/warehouses) will also be assumed as a given and considerations include:

- Channel definitions
- Customer service requirements
- Product characteristics
- Region disposition
- Reverse logistics
- Vehicle configuration and routing

Before initiating the proposed project a number of red-tape obstacles will have to be overcome in terms of data and information gathering that might possibly be sensitive to the outside world. The

confidentiality level of the clients' trade secrets will have to be approached correctly and respected in order to uphold the informational integrity and to avoid industrial espionage.

The proposed solution will be applied and tested to an existing client's operations to determine the practicality of design parameters. The client will be in the Fast Moving Consumer Goods (FMCG) industry; a suitable environment that will certainly benefit from the implementation of such a new logistics solution.

This venture will seek to perfectly balance logistic operating constraints and customer service levels in order to benefit from doing so. The project should be aligned with sales and commercial models and therefore not seen in isolation, but as a holistic supply chain solution.

1.4. Project Scope

The scope oversees the limitations within which the venture has to be completed and for the purpose of this dissertation it will only entail defining the subject matter extensively; leaving the actual client relations in the capable hands of the final year project partner (ID). In essence the intended project solution will be done within the Industrial Engineering Departments' capacity and the possible structure implementation by ID.

The project will mainly focus on outbound logistics, including activities and cost associated with:

- **Primary Distribution** (inter-warehousing/inter-depot transport)
- **Secondary Distribution** (products en-route to customers/final destinations)

ID will most certainly provide inputs into client's planning processes, especially logistical, as one of the outcomes is, for example, to give recommendations on the minimum order quantity/value when considering total distribution cost.

This emphasizes the importance of an integrated solution to ensure that a very close relationship exist between the client and logistics service provider (LSP) in order to efficiently balance holistic inputs and outputs from the transformation process.

The project will focus on existing customer channels/segments and will be provided by ID and client stakeholder information. The improvement strategy will be formulated based on the agreed service requirements by each of these channels; typical requirements will include the key logistics drivers such as:

- Delivery smoothing
- Drop frequency
- Drop size
- Nominated delivery days
- Product range
- Returns policies
- Vehicle configuration and routing

A Cost-to-Serve analysis study will form the base to determine the business case for potential change; taking the current operations of the client into account (say **AS-IS** structure) it can be defined and improved upon to become the **TO-BE** system we want to apply into the cost-analysis framework for comparison purposes.

1.5. Document Structure

This dissertation is divided into several sections in order to maintain clarity and chapter contents can be describe through the following paragraphs:

1.5.1. Introduction

This section in the report establishes the background of the project and describes the outcomes and milestones associated with the aim and scope of the venture. A detailed company profile is discussed as well as an approach to the FMCG industry partner where the planned concept will be tested and possibly applied. The introduction also states client requirements as it describes what the objectives of the project are in regard to the obstacles that will be faced throughout the endeavour.

1.5.2. Research Document

The literature study, in terms of this project topic, looks at a wide range of aspects that has to be kept in mind in order to understand the bigger picture. Therefore, article references are cited in order to highlight the opinions of different individuals and institutions. This forms a firm grasp on certain ideas and enables a good comprehension regarding features mentioned in the review.

1.5.3. Selection of Appropriate Methods, Tools and Techniques

The focus of this section concentrates heavily on a Cost-to-Serve analysis study that applies to a distribution system and, in this case, to the Fast Moving Consumer Goods (FMCG) industry. The final objective of this model is to establish the costs (logistic activity costs) of delivering products to specific customer channels/segments which will be identified and classified accordingly.

This concept is generated from an actual Cost-to-Serve study done in the past to a different FMCG company by (Jooste, Marius and van Niekerk, Henk 2009) and most of the ideas/procedures will be incorporated into this project. Although it has already been done, the design and implementation regarding this specific case will differ radically and only previous insights can be used.

1.5.4. Data Analysis

The required information/data is described in this segment of the project and an approach to the input model is discussed. Analysis regarding the current AS-IS system is done in order to understand the situation being dealt with in the capacity of the FMCG industry.

Furthermore, the identification of design as well as model structure aspects is included in this chapter in order to base the project concept on.

1.5.5. Design Concept

A critical analysis study regarding the TO-BE system starts of this part of the document and includes the development of a dedicated solution for the situation at hand. The problem solving approach is elaborated on and highlights the key insights of where improvement areas lie.

Application testing and model implementation factors are discussed in this component for possible alternatives to the specific solution.

1.5.6. Conclusion and Recommendations

A summary ties up all the factors that were looked at in this thesis and possible recommendations for the project solution are mentioned. A recap of all the chapters in this dissertation is also given to establish clarity regarding the entire venture.

1.6. Section Summary

The introduction chapter in this dissertation opened up the possibility of implementing appropriate service packages to the secondary distribution system; generated from a Cost-to-Serve analysis study that will develop into customized Route-to-Consumer strategies.

The CTS model identifies improvement areas for potential change and are run twice; first for the current AS-IS system and then for the altered TO-BE system in order to illustrate the amount of beneficial change. These adjustments will be made in accordance to the customer channels that require the most alteration in order for said segment to yield low Cost-to-Serve amounts vs. high profitability values.

A research document in the form of a literature review is to follow this section and describes the aspects to project that needs to be kept in mind throughout. These factors are mentioned in order to establish the right frame of mind when continuing with the rest of the paper.

2. Research Document

The literature review broadly looks at the problem issues at hand from a research perspective where intense investigation took place from numerous sources regarding the project topic. At first glance the issues that are addressed doesn't make sense and relevance to the project might not be clear; it is to enforce a better understanding of the overall scenario that is being dealt with.

2.1. Literature Review

The approach for the literature review is to break down the project title: **CUSTOMIZING ROUTE-TO-CONSUMER STRATEGIES TO COST EFFECTIVELY IMPROVE SERVICE LEVELS TO VARIOUS CUSTOMER CHANNELS**; in order to better understand the components that make up the topic and to describe the business essentials. The main elements that will be discussed are:

- Control in Logistics Service Providing
- Customer Relationship Management (CRM)
- Economic Implications (Cost Analysis and Profitability Management)
- Fleet Mixes and Vehicle Routing
- Performance Measurements
- Supply Chain Processes

Research and information includes the above categories and references are cited where necessary.

2.2. Customizing Route-to-Consumer Strategies

This part of the project can be seen as developing a tailor-made solution for one of ID's clients operating in the FMCG industry using previous models applied to similar clientele.

A Route-to-Consumer strategy is the way in which the secondary distribution system is structured in order to provide the customer with products; viewed from a logistic service component. In essences RTC decides what would be better for each individual customer channel while focusing on the bigger basket of routes, taking regions into account that has to be completed.

2.2.1. Logistic Service Operations

Organisations seeking to improve their business processes usually look at their logistics performance first and decide if it would be better to outsource this function to a specialist in the field. Applying operational supply chain techniques to the appropriate industry will benefit the said company and promote their source capital and communications. (Sohail, M. S. and Sohal, A. S. 2003)

This viewpoint of IMPERIAL Distribution is emphasized because it is their main form of commerce; understanding their core competencies makes the problem more understandable.

2.2.2. Strategic Benefits of Logistic Alliances

Logistic alliances between supply partners often are the unique link that encompasses best business practises and breaks down difficulties that are related to seller and buyer liaisons. Informal commitments in the transportation sector seem to be a common occurrence and it might be an identification of an improvement opportunity. (Bowersox, Donald J. 1990)

This aspect will be looked at when dealing with the customer specific service packages that can be applied to the non-profitable patrons using CTS modelling. The appropriate alterations to the secondary distribution of said customer will allow the business entity to be more lucrative.

IMPERIAL Distribution, being in the position of providing logistic services, makes the ideal candidate to bridge these alliances in the form of linking process entities and; becomes the fundamental understanding of vertical integration regarding supply chain theories.

Logistic Service Providers (LSP) is an important facet when it comes to supply partners and the distribution network that link these “handovers”. It can be looked at as product stock being shifted between stakeholders and possibly undergoing value-adding processes along the way. This ownership transfer is basically cutting out the middleman without eliminating the concept completely; the organisations involved still make their profit through service charges; the overall transaction takes place between the initial supplier and final customer. (Bowersox, Donald J. 1990)

Business units meshing together working towards mutual goals, in the procurement industry, will be beneficial to all parties involved. For a process to run like clock-work; effective arrangements (either formal or informal) and transparency, above all, between the supply chain partners is required. In this manner better decisions can be made using intuitive knowledge that was previously unavailable to vendors and customers. (Bowersox, Donald J. 1990)

In some instances IMPERIAL Distribution might still be operating as a single service provider only claiming shared revenue under management fees once items has reached their final destinations.

2.3. Cost Effectively Improve Service Levels

This segment in the project title relates to the economic implications, performance levels and customer satisfaction levels that deals with the main objective of the entire venture.

2.3.1. Supply Chain Cost Management

Over the past few years a definite trend could be seen in manufacturing and selling costs of products mostly dedicated to globalisation and industry competitiveness. The following extract describes how organisations should change their mind-set towards logistic-base activity costs and customer satisfaction in order to benefit/profit from this 'Best of Both Worlds' strategy paradigm shift (Christopher, Martin and Gattorna, John 2005):

"Continued deflationary trends in many markets around the world are creating greater pressure for cost reduction in order that profit margins can be maintained. Customers and consumers are increasingly value driven and consequently less brand or supplier loyal. In this challenging world, there is a growing recognition that creative pricing strategies combined with effective supply chain management provide opportunities for significant cost reduction and increased profits.

As competitive pressures have rapidly increased over the last decade, we have been forced to look beyond conventional wisdom because this only leads to diminishing returns. For example, for a long time, we have accepted the convention that as service levels rise, so also does the Cost-to-Serve, exponentially.

However, we now understand that this equation is influenced by both over-and under servicing that leads directly to low cost-effectiveness and lost revenue opportunities. Inappropriate pricing regimes and trading terms are integral to this inefficient use of resources.

The more realistic the paradigm is that Cost-to-Serve will actually decrease (up to a point) as service profiles increase. See Figure 2. Re-engineering efforts must seek to find the optimal or appropriate level of service, driven always by customer needs and behaviours:

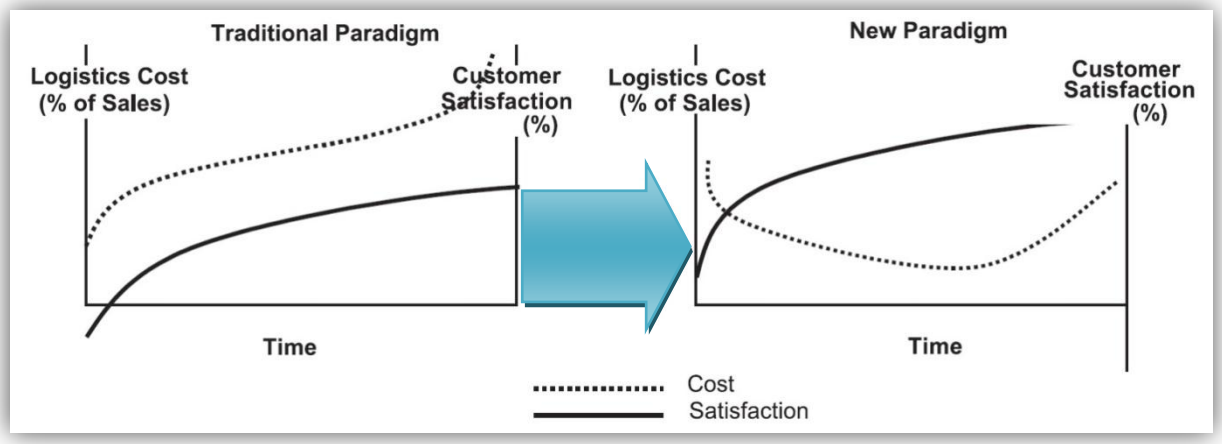


Figure 2: The Cost/Service Paradigm Shift to the 'Best of Both Worlds' Strategy

(Christopher, Martin and Gattorna, John 2005)

However, this phenomenon only occurs through improved re-allocation of the firms resources; we call this 'strategic alignment', or simply 'alignment'. Driven mostly by the pursuit of functional specialism, the concept of 'alignment' has been largely overlooked, but in today's operating environment, that is where the value lies." (Christopher, Martin and Gattorna, John 2005)

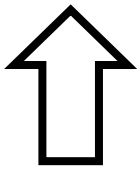
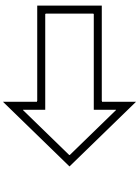
2.3.2. Cost Analysis and Profitability Management

Cost effectiveness relates to two facets in the financial statements of a company; the first is to increase profit and therefore revenue by means of new business or promoting the organisations' products/services.

The second aspect is cost reductions in terms of decreasing company expenses which is also the main focus point for this project; considering the upsell opportunities.

Profit is influenced by the "revenue-minus-costs" equation; positive upsell profit opportunities refers to the amount of increase in revenue and decrease in operating expenses as illustrated in Table 2:

Table 2: Upsell Profit Opportunity Approaches

Approach	Description	Revenue	Costs
1	The first option might be to execute a plan that increases the revenue marginally bigger; measured against the cost of implementing such a strategy.		
2	Other alternatives include small revenue increases with the cost of such an option not playing a major role of the said strategy; keeping expenses constant.		
3	To be more lucrative according to the profit equation; cost reduction tactics can be incorporated into the comparison with minimal revenue changes.		
4	A final alternative can be to incorporate large cost saving amounts through the applied strategies influencing the revenue income slightly.		

Cost savings occur once a detailed study of organisational expenses is conducted according to the cost drivers (logistic activities); pinpointing opportunities for effective enhancements being the primary focus of the project; improving service levels while considering the economic implications.

In modern times it is the core competencies of the company that distinguishes it from another and, keeping economic cost considerations in mind, a unique class of quality towards products, processes and services will set them apart from the rest. (Porter, Michael E. 1998)

2.3.3. Performance Measurement and Control in Logistics Service Providing

This project will eventually lead to a face-off analysis between the current AS-IS system and the proposed TO-BE implementation from the general Cost-to-Serve model.

Key Performance Indicators (KPI's) as well as Stock Keeping Units (SKU's) will be utilized in the study, used before and after implementation in order to see if the alterations are worth pursuing; in this case the modifications will be applied to aspects such as:

- Channel properties
- Customer destinations
- Product specifications
- Region disposition
- Vehicle configuration

IMPERIAL Distribution uses a number of Key Performance Indicators on the logistic side of operations. These measures can be used to see if improvements came about from changing the system.

The accurate planning of tactical operations can result in a considerable rise in good KPI's. (Krauth, Elfriede et al. 2005)

2.4. Various Customer Channels

Approaching this part of the project topic involved looking at customer specific requirements and how to manage these relationships in order to have lasting commitments; especially for IMPERIAL Distribution with its wide client base.

2.4.1. Customer Relationship Management (CRM)

As the world is leaning more and more toward a universal market place (global village) it is necessary for establishments to become better prone to customers' attentive needs through Customer Relationship Management. (Peppard, Joe 2000)

Good CRM practices are needed to sustain long-term co-operation and to prolong contracts between suppliers, supplier's suppliers, customers, customer's customers, etc. CRM software such

as extended versions of *SAP* and *PeopleSoft* assist everyday institutes in managing their client base correctly, employing such solutions will ensure lasting business.

Customer Relationship Management (CRM) appears to be an important factor in business especially regarding the clientele for IMPERIAL Distribution as they deal with both suppliers and customers simultaneously; the pressure therefore exist to deliver world-class services to all of them.

Active areas in the industry that have a lot of potential for advancements are, for one, quality management regarding manufacturing procedures, being a rich field for improvement opportunities; using statistical process control techniques.

Another approach is a customer-focus study analysis; there is a lot of room for improvement in the area of client relations and if implemented correctly might lead to profitable alternatives. (Kim, Jonghyeok et al. 2003)

This aspect will only be kept in mind when doing the project as customer service and satisfaction plays a crucial role regarding implementation of the Route-to-Consumer strategies.

2.4.2. Quick Response in Manufacturer-Retailer Channels

In an ideal world a Quick Response (QR) system will enable organisations to receive required stock/material/services much faster if the QR efficiencies were to follow in an upstream direction along the supply chain. This is the essence of fast moving processes driven by information collected from the customers in a downstream direction. (Bergen, Mark E. and Iyer, Ananth V. 1997)

Another way of looking at Quick Response (QR) processes can be describe as putting planning and ordering activities in the hands of the supplier. In this way total control is given to the vendor who monitors stock levels at the different customer destinations and once the demand for product arises, deliveries are sent out.

2.5. Section Summary

This chapter gave an overview of all the relevant factors forming bigger picture aspects; it looked at the specific tactical/operational decisions that have to be made in the FMCG environment. The relevant considerations were included under the appropriate reference headings and the work of individuals and organisations were cited where necessary.

The section also indicated the concepts in the project being applied and discusses the success factors of a Cost-to-Serve (CTS) model. Therefore CTS theories can now be customized and applied to the situation that this venture is dealing with.

The next part on "Selection of Appropriate Methods, Tools and Techniques" to follow this chapter concentrates more on the scenario that ID is currently in. It describes the investigation into CTS modelling and will eventually lead to the recommended Route-to-Consumer strategies.

3. Selection of Appropriate Methods, Tools and Techniques

This section goes into more detail regarding the reality of ID's scenario and concentrates on the significance of applying the correct techniques for the current situation; based on a Cost-to-Serve analysis study previously done in the past.

3.1. Tool Selection Approach

When approaching a Route-to-Consumer (RTC) strategy from a Cost-to-Serve (CTS) modelling perspective in the Fast Moving Consumer Goods (FMCG) industry, it is best to start with the costing implications and financial outlay of the distribution system within the organisation.

3.1.1. Problem Definition

"For most FMCG manufacturers in South Africa, outbound logistics cost amounts to between 5% and 15% of the sales value. In this complex trading environment, many companies are experimenting with various ways to increase profit. Several programs are launched looking at ways to reduce cost and also a significant amount of time is spent thinking about new products and servicing more customers. The reality, however, is that in most instances companies do not understand the profitability of current (let alone new) channels, regions, products and customers. This is simply as a result of insufficient information available from traditional accounting statements." (Jooste, Marius and van Niekerk, Henk 2009)

"Customer profitability is usually calculated on a Gross Profit level (net sales contribution less cost of goods), and therefore excludes all other activity costs. Cost-to-Serve (CTS) modelling translates supply chain activities into Rand and Cents in order to determine a customer/product's true contribution to an organisation's bottom line. This is a critical understanding for building future agile supply chains." (Jooste, Marius and van Niekerk, Henk 2009)

The aspects that need to be considered in a Cost-to-Serve analysis study and modelling are described in detail in this section under the appropriate headings.

3.2. Route-to-Consumer

Route-to-Consumer in essences decides what would be better for each individual customer channel while focusing on the bigger basket of routes that has to be completed. The best initial approach to take when looking at RTC initiatives is to explore the logistic base costs found in an organisations' income statements and balance sheets discussed under the Cost-to-Serve section.

Specialised logistic services include concentrating on the image of the clients' distribution system; RTC strategy packages are set in place to service the various customer channels with alternative delivery networks. This entails defining specific customer relation processes and influences the activities per channel.

3.2.1. Primary Distribution

This component to logistics is worth mentioning because in some instances of the project primary distribution delivers to certain customer channels/segments; by bulk direct form the factory.

It is necessary to understand how this business entity functions to realise the impact it has on the secondary distribution system, which is the image of the client; whereas primary distribution is mostly larger and has the capability to rotate unbranded vehicles internally.

3.2.2. Secondary Distribution

The project mainly focuses on secondary distribution and the objective definition for this logistic element follows in the extract below:

"To get the right product, at the right quantity, at the right quality, to the right customer, within time, BUT understand delivery cost relative to service value created." (Jooste, Marius and van Niekerk, Henk 2009)

This outbound logistic function operates with the image of the client (product quality and service value) and on time-sensitive schedules; it is required to observe the cost allocations of secondary distribution in order to critically analyse where possible areas for improvements might be.

The following table (Table 3) lists the differences between primary and secondary distribution:

Table 3: Primary/Secondary Distribution Differences

Primary Distribution	Secondary Distribution
Internal (internal distribution network)	External (customer interfaces)
Larger volumes	Smaller volumes
Less frequent deliveries (bulk)	More frequent deliveries
Limited number of SKUs	Multiple SKUs
Mostly unbranded trucks	Branded trucks for client's image

Figure 3 below depicts the relationship between Primary and Secondary Distribution as both entities have very similar properties and, as a whole displaces products from its original source to the final destination. There is, however, a level change in the sense of breaking bulk and secondary transportation taking place in branded, different sized trucks:

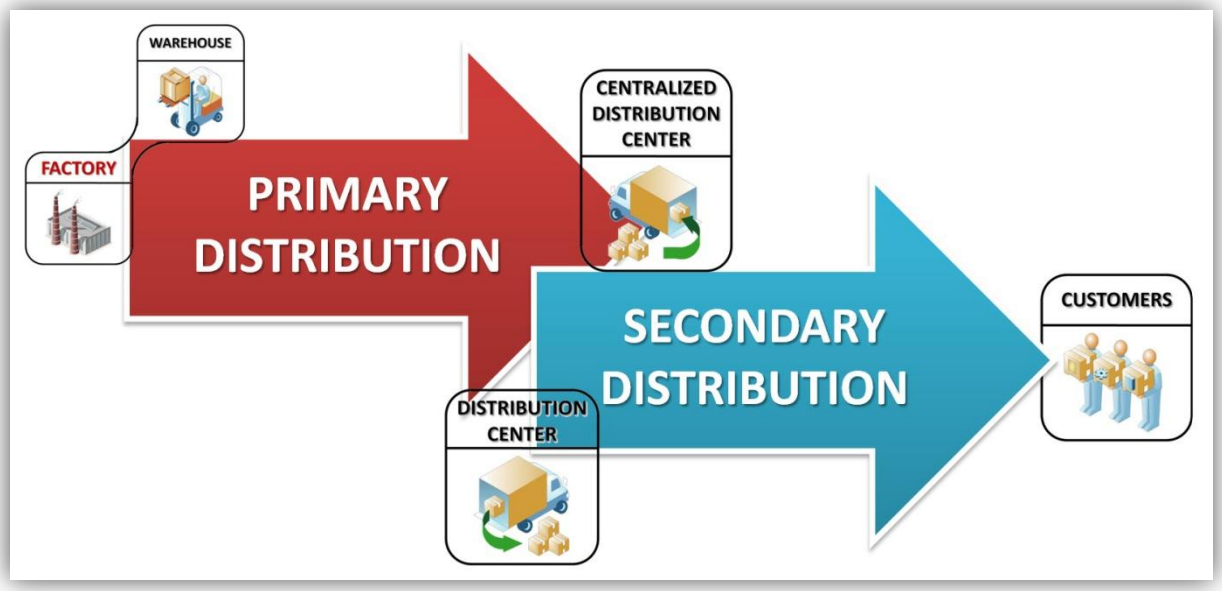


Figure 3: Primary and Secondary Distribution Relationship Diagram

Contrary to normal belief the weighing factor in FMCG specific logistic solutions is not directly related to the variable distances travelled to the final destinations; but rather influenced by product volumes and the number of drops by region to the various customer channels.

Time should therefore be viewed as the constraint and be controlled as a limiting factor with secondary distribution in Fast Moving Consumer Goods (FMCG) industries.

3.2.3. Distribution Network Analysis

The Fast Moving Consumer Goods (FMCG) industry partner being studied deals with both national manufacturing and international imports of product. IMPERIAL Distribution has the responsibility of providing logistic services on behalf of the client and further implementing improvement Route-to-Consumer (RTC) strategies that will be beneficial for all parties involved; experiencing cost savings where possible.

Figure 4 gives a picture of how the distribution network is routed through the different storing facilities and distribution centres until the product gets to its final destination via predetermined customer channels (considering the secondary distribution in blue lines):

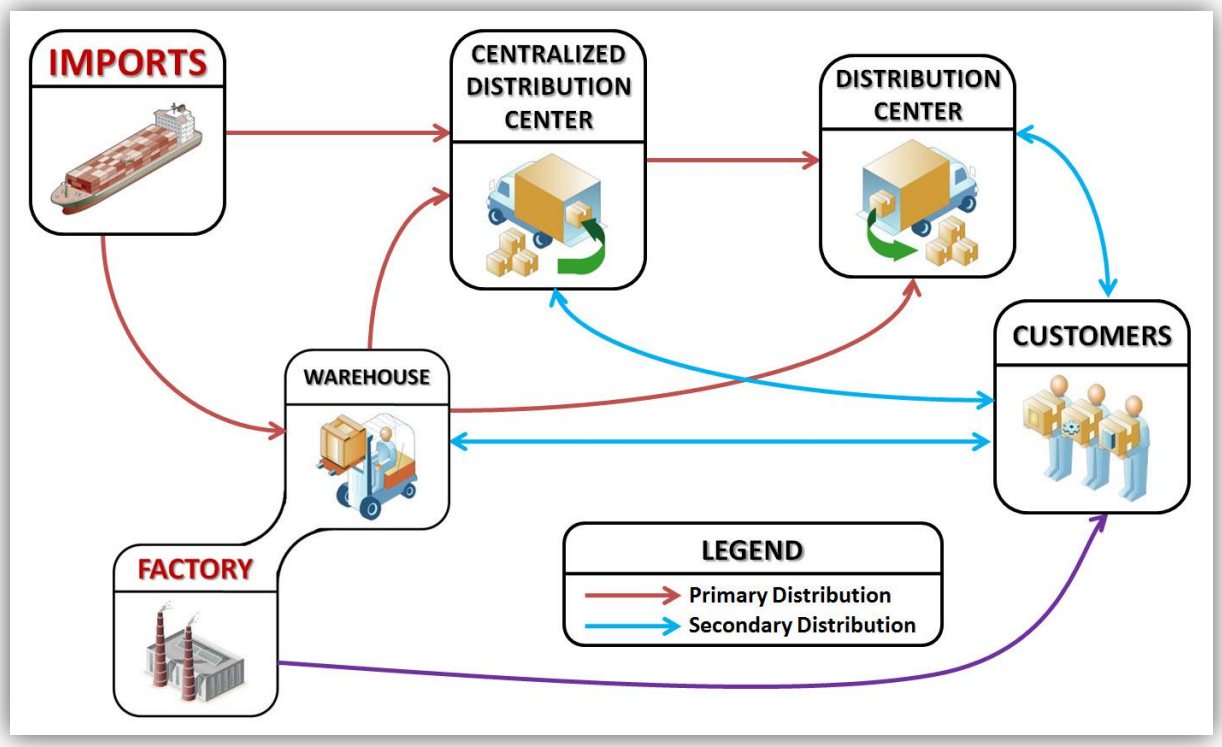


Figure 4: Distribution Network Analysis

Specific costs are connected to the various distribution methods currently employed on the AS-IS system. Different customers receive their orders from several distribution entities but apart from this there is the issue of the assortment patrons that exists in the network (different types of customer channel deliveries).

Variable cost (driven by distance) and fixed truck costs are also influential factors. Key indicators regarding vehicle deliveries are the stop, travel and utilization times of the trucks. IMPERIAL Distribution has specific charging models for each specialised logistic service.

Other factors can be described as invoice data grouping (counting the number of deliveries), and truck capacities that is influenced by the frequency of drops. Fleet mix sizes and vehicle routing combinations are also important when deliveries are made to a number of customers with the same channel properties.

The question is what kind of service package along with the type of distribution system should be dedicated to a specific customer channel and region in order for the client and the Logistic Service Provider (LSP) to be more profitable or gain equal benefit?

Cost-to-Serve modelling indicates which customers are beneath a profitable margin and should be altered in order to elevate said customer to a more favourable position.

3.3. Cost-to-Serve

Until recently the pressure on management existed to concentrate on total cost reductions without thinking it might influence areas that does not need savings; Cost-to-Serve (CTS) modelling looks extensively at financial records and the different customer channels in order to identify the improvement opportunities related to logistic service costs:

The potential benefits of Cost-to-Serve modelling are (Jooste, Marius and van Niekerk, Henk 2009):

- A systematic approach to increase profitability
- Create a platform to develop the appropriate Route-to-Consumer strategy
- Drivers (of cost and performance) and their impact are understood (not just their result)
- Opportunity to increase service levels
- Pro-active approach to managing an efficient Route-to-Consumer strategy
- Transactions are understood from a customer rather than internal perspective

Information and data regarding the CTS model is approached from a financial standpoint and so specific logistic activity costs can be established for the various customer channels.

A practical example of this situation would be extracting transactional order information from the database of the FMCG partner and importing it into a Microsoft Excel workbook for analysis purposes. This type of information was made available from a marketing perspective and can be used in allocating specific secondary distribution systems to the various customer channels.

Distribution, in this case, will most likely be in the form of secondary transportation; that is not to say that deliveries to customers are being executed on a beneficial manner. Alternatively, by means of primary distribution (factory direct deliveries - referring to the purple line in Figure 4); a new channel can be installed which might drastically cut costs and prove to be more profitable.

Now an analysis can be applied to the current AS-IS system in order to see how the different pre-determined service packages react with the set of customer channels under classification. Finally all available distribution packages will have been compared to the channelling templates yielding the optimal logistic service for the appropriate customer. Critical success factors to CTS are listed below:

Table 4: Cost-to-Serve Critical Success Factors
(Jooste, Marius and van Niekerk, Henk 2009)

Cost-to-Serve Aspect	Description
GOAL	Strategic advantage in outbound logistics. Outbound logistics is the movement of material associated with storing, transporting, and distribution of a firm's goods to its customers.
PROBLEM	Various manufacturing sites, with multiple distribution centres and an ever expanding customer base, which is not in itself a problem, but the complexity associated with increasing customers, especially bottom-end all with unique service requirements.
APPROACH	Important in this instance to determine if reduced costs may impact customer service, and if it does, if this will negatively impact revenue in turn. This will typically be via the creation of a competitive service offering such as reviewing the product mix offered to customers.

The comparison procedure is part of the CTS model but in order to achieve the necessary output an activity cost analysis has to be performed for each specific customer channel/segment.

3.3.1. Financial Outlay

As mentioned before, the financial analysis regarding Cost-to-Serve modelling is important in finding the customers where implementing a channel specific service package may yield the optimal output.

This implies looking at the logistic activity costs, when servicing a customer, which contributes to a company's profit and overheads. Splitting these activity/service costs will highlight the elementary charges on which to focus. Typical examples will be eliminating unprofitable customers, while simultaneously growing the share of customers at the remaining profitable channels/segments.

The illustration on the next page (Figure 5) depicts the typical customer account profitability as well as the allocation of costs and profits (Christopher, Martin 1992). The "Logistic Service Cost" component in the diagram will be viewed as the main focus when establishing activity costs.

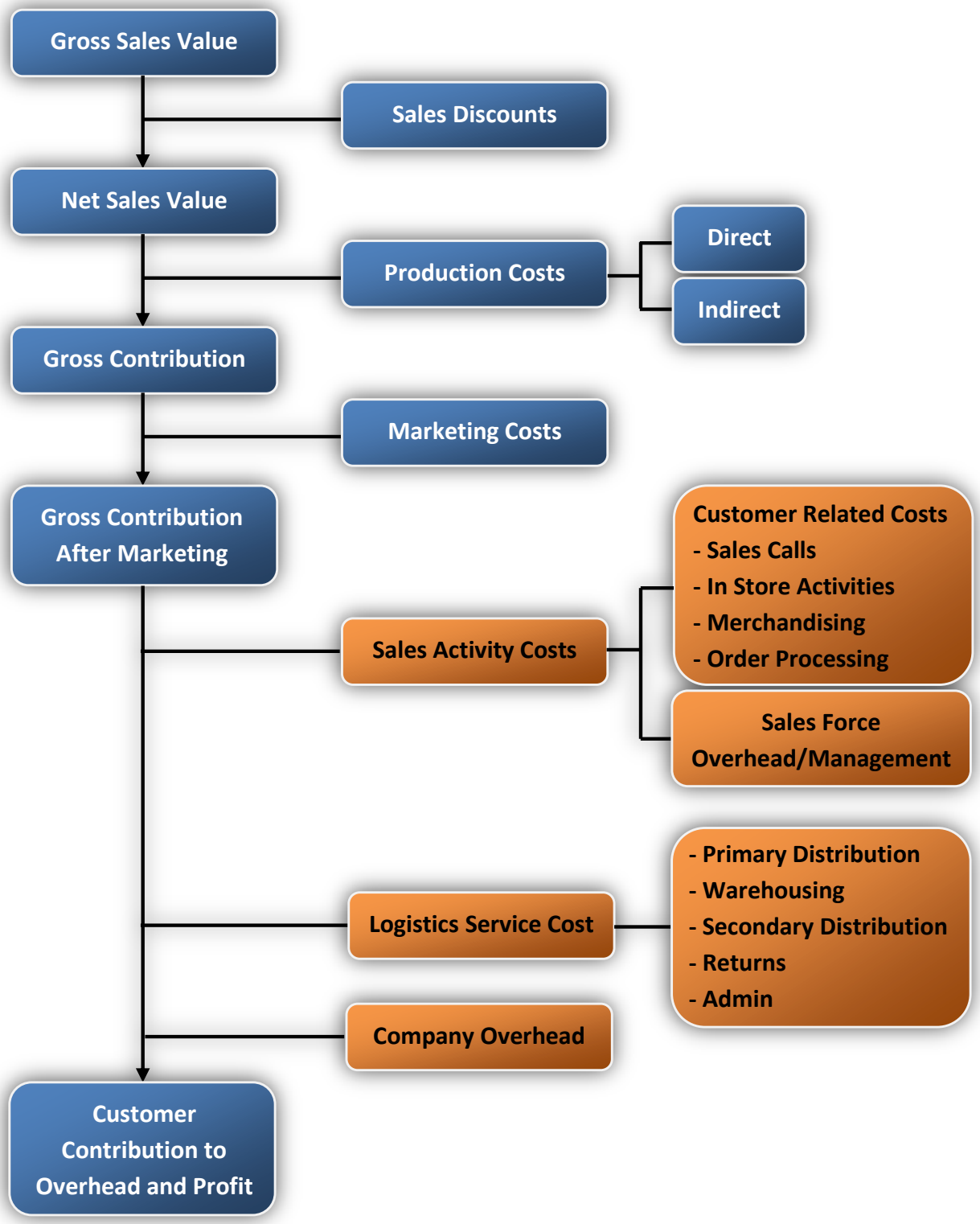


Figure 5: Allocation of Costs and Profits
(Christopher, Martin 1992)

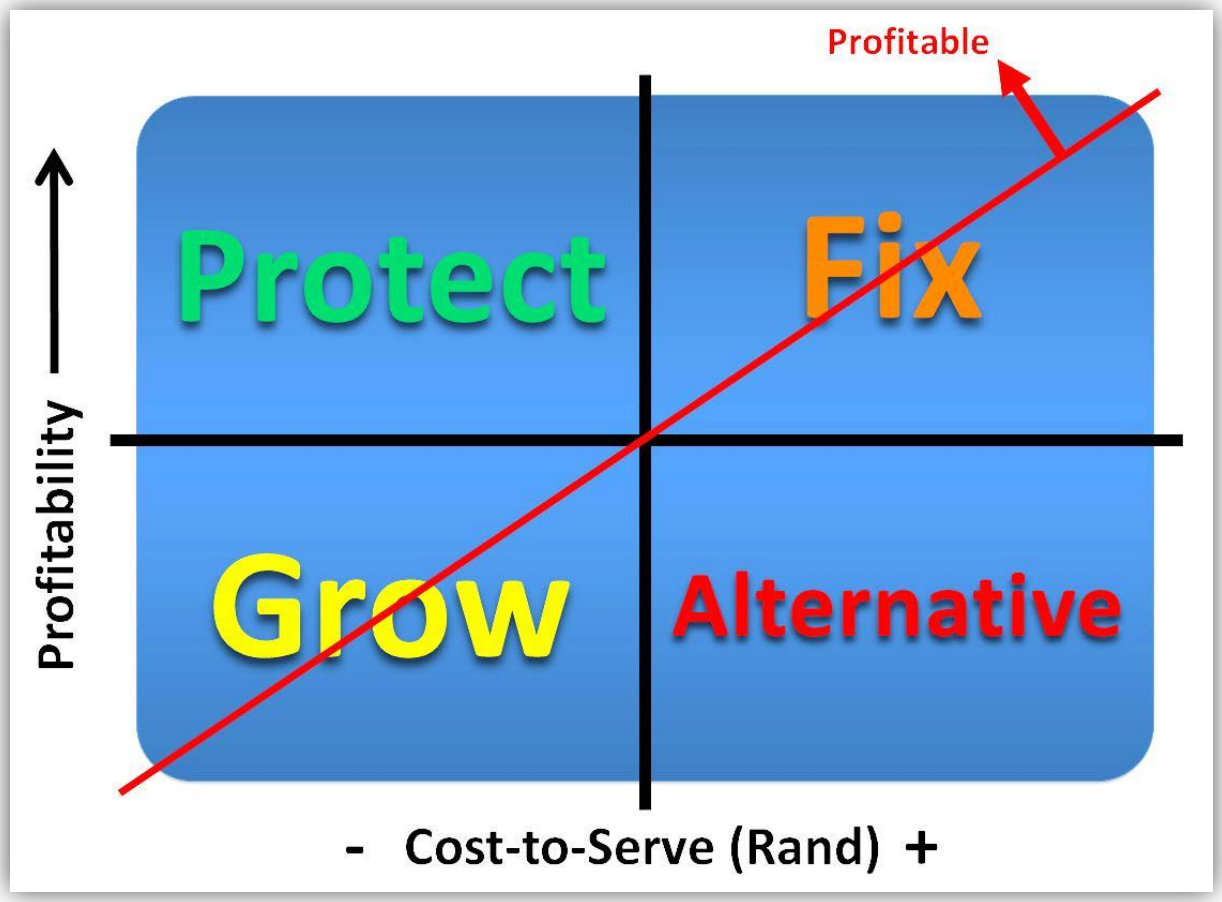


Figure 6: Cost-to-Serve vs. Profitability
(Jooste, Marius and van Niekerk, Henk 2009)

Figure 6 portrays possible strategies that influence customer profitability in the CTS model; splitting the graph into quadrants, each customer, channel or region can be classified into four groups; Table 5 describes the customer specific quadrants that are in the Cost-to-Serve versus Profitability graph:

Table 5: Cost-to-Serve vs. Profitability Quadrant Description
(Jooste, Marius and van Niekerk, Henk 2009)

Quadrant	Description
GROW	These customers can be improved by increasing the revenue while maintaining costs. This can be achieved through horizontal (increasing the number of customers/market footprint) and/or vertical growth (selling more volumes of the existing product range) opportunities.
FIX	In this instance the focus is not the growth of sales, but rather focusing on reducing costs by fixing specific cost drivers to more realistic levels, such as delivery frequency.

ALTERNATIVE	These customers probably have limited growth potential and the cost to serve remains large due to aspects such as distance or delivery frequency. These customers cannot be serviced economically as part of the existing route to market and alternative, or cheaper, distribution channels should be identified to service these customers.
PROTECT	The value of formulating service strategies for profitable customers is just as important. Doing so can further increase profit margins and cater for the customers' specific service requirements. Companies should protect profitable customers by strengthening the relationship & keep on exceeding customer service level targets.

"The fact is that many FMCG companies are currently servicing unprofitable customers. In other words, the cost to service a specific customer is greater than the sales contribution generated from that customer. So the opportunity is clear, you should ensure the Cost-to-Serve is less than the sales contribution for all your customers. This implies that all your customers are making a positive contribution to the companies' bottom line." (Jooste, Marius and van Niekerk, Henk 2009)

The Cost-to-Serve quadrant illustration is a good visual representation of the path to follow when dealing with a certain customer channel in the critical analysis phase. It shows what to do when the customer is in an unfavourable condition in order to elevate it to a 'PROTECTED' state where the cost to service that channel becomes marginally less than the profit line of the organisation.

Now that the output model is ready in terms of the CTS approach being clear; the next step would be to submit a formal Request for Information (RFI). This information will be obtained from the FMCG industry partner being studied. The relevant data that will be requested is, as in the Cost-to-Serve comparison model:

- Current secondary distribution network
- Customer channels/segments
- Depots/regions
- Product specifications
- Volumes and product values

This data will be taken for a certain period of time and the model might be developed to such an extent that it becomes the planned dynamic-variable channelling model that realizes with live data.

Once the amounts are established for the numerous customer channels from the client's database it can be plotted on the comparison model developing into the Cost-to-Serve vs. Profitability graph.

The key logistic cost drivers (specific expenses assigned to certain activities) in this project can be viewed as factors that will alter the Cost-to-Serve model and are listed below:

- Admin and off-loading
- Driver wages
- Fixed truck utilization costs
- Initiation and on-loading
- Variable distance to destinations and back to source

Customer segments that are not lucrative will be identified and proposed service package changes will be applied to said customer for them to reach the 'PROTECTED' quadrant of the CTS graph.

Needless to say some very low-profitable (marginally) customer channels with high Cost-to-Serve totals may have to be entirely reconsidered in terms of their logistic services, currently carried out operationally/tactically.

3.4. Service Packages

Assuming the current footprint of the secondary distribution system to the various customer channels, also keeping in mind the relevant product basket (merchandising aspect) and stock keeping units (SKUs) for each channel; a channel-to-product matrix can be compiled pinpointing in which Cost-to-Serve quadrant the customer is trading in.

3.4.1. Case Study

With this information strategic decisions by management can be made to ensure profitability across the different channel-product combinations. Client specific service packages dedicated to the various customer segments developed by IMPERIAL Distribution must have an array of menu

offerings that serve each individual channel in a unique way and will benefit the organisation with maximum gain as via the tested case study:

"The agreed service packages were applied to the entire customer base. The resultant effect in terms of cost and sales were determined to understand the impact of the change in service offerings. It is evident that many customers become profitable once the service packages were applied. It was clear that most of the smaller customers (in terms of sales) were actually over serviced. The strategy to improve the remaining unprofitable customers is to either increase sales through clever marketing strategies, or service through cheaper distribution channels." (Jooste, Marius and van Niekerk, Henk 2009)

Similar packages will be implemented in this project's model but concentrating more on the logistic operations aspects. Primary costs effects total supply chain moves, from where customer demographics plays a role, in the marketing distribution side of the business. It is important to distinguish these activity-based costing entities in order to differentiate between the customer channels and to place the customers within the different CTS model quadrants.

Channel specific allocations measured by the region of each customer destination will influence the service package and product solution; emphasis should be placed on the different unique solutions to various customer channels. From there a buyer specific pot of menu offerings to the various customer channels can be developed and possibly implemented.

3.5. Section Summary

The section on "Selection of Appropriate Methods, Tools and Techniques" discussed the potential benefits of running a Cost-to-Serve model through the business applications of a FMCG industry. The chapter also described the way in which a CTS model has altered Route-to-Consumer strategies with the implementation of logistic service packages through practical examples.

Now that the base for possible change has been established in the form of the above mentioned approaches; the next step were to look at the available transactional order information gathered from the FMCG partner in the section on "Data Analysis".

The present footprint (current distribution network structure) will be referred to as the AS-IS system and will serve as the base when comparing it to the recommended TO-BE overlay system. The suggested TO-BE model is discussed under the "Design Concept" section of this dissertation.

4. Data Analysis

As mentioned in the research study all relevant data are obtained from the FMCG industry partner by means of a request for information (RFI); the required information can be described in Table 6 with the following elementary components:

Table 6: Required Information from FMCG Company

Information	Description
Various Customer Channels and Regions	Detailed array of customer information from client database entered into segments which secondary distribution packages service.
Secondary Distribution Network	Service package network specifications and Interfaces as well as Logistic Services to Customers.
Product Specifications and Volumes	Explicit product conditions in terms of WHAT is being transported and HOW it should be transferred determined by the volume/value of the product.

The different aspects are initially populated with relevant information received from the FMCG partner through gathered data from the RFI file. As indicated above an observation combination is run for a set of inputs from the various aspects yielding a Cost-to-Serve vs. Profitability value obtained from the model as output.

4.1. Input Data & Analysis

Many companies trading and operating in the FMCG industry will most likely run all their transactional information through ERP software applications such as *SAP*. For this project purposes the gathered information was extracted from their database and imported into a Microsoft Excel workbook for analysis proceedings and graphical representation. Appendix A: Specific Data Pools and Headings; describes the data (pools and headings) obtained from the company's database.

4.1.1. Data Masking

Due to the confidentiality nature of the information being shown it will be noted that no direct values are given on the charts and the legend names will also be masked in the form of codes being assigned to specific product classes as well as channel categories.

4.1.2. Analysis and Graphical Representation

This isolated study is fact based regarding the transactional information of the client and was divided into two major groups which will serve as the key measurements namely:

- **VOLUME** (units delivered – per item measure)
- **VALUE** (net worth of the goods delivered – monetary measure)

Value amounts relates to the Cost-to-Serve model; as the profit margin is connected to this information. Furthermore the product line (SKU's) was also divided into two main pools:

- **HIGH VALUE** (high value – low volume products)
- **HIGH VOLUME** (high volume – low value products)

The following pie chart (Figure 7) illustrates the portion of each product class; either for the VOLUME/VALUE SKU's, from all the available information. It can be noted that from the same data set (entries over a one month period) that the high volume product class (low value) takes up most entries in terms of VOLUME as opposed to having the VALUE product entries for the same set:

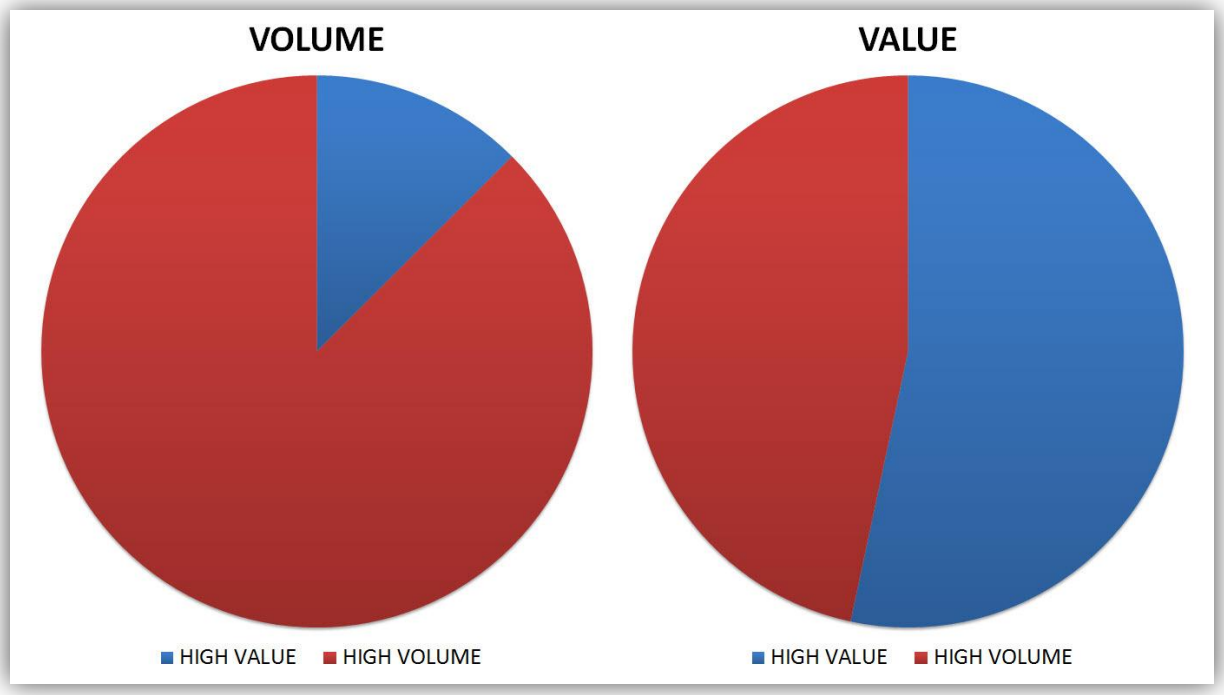


Figure 7: Volume/Value Comparison Chart between Product Classes

It is important to understand that delivering lower volumes of higher value products, and vice versa, influences the distribution system and customer channel interfaces as well as the profitability.

The next two graphs shows what happens on each day over the month period as orders for products were placed from the transactional data. The two charts (Figure 8 and Figure 9) are placed close to each other for comparison purposes and each indicates the product class assignments (blue/red) in terms of VOLUME units against the same measured VALUE amounts of SKU's:

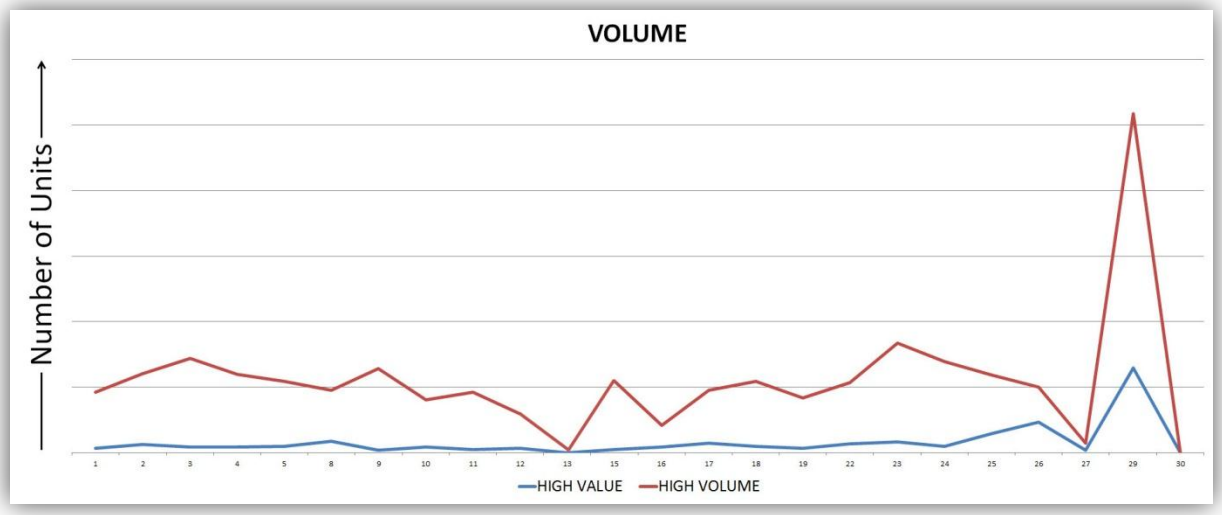


Figure 8: Volume over Month Period between Product Classes

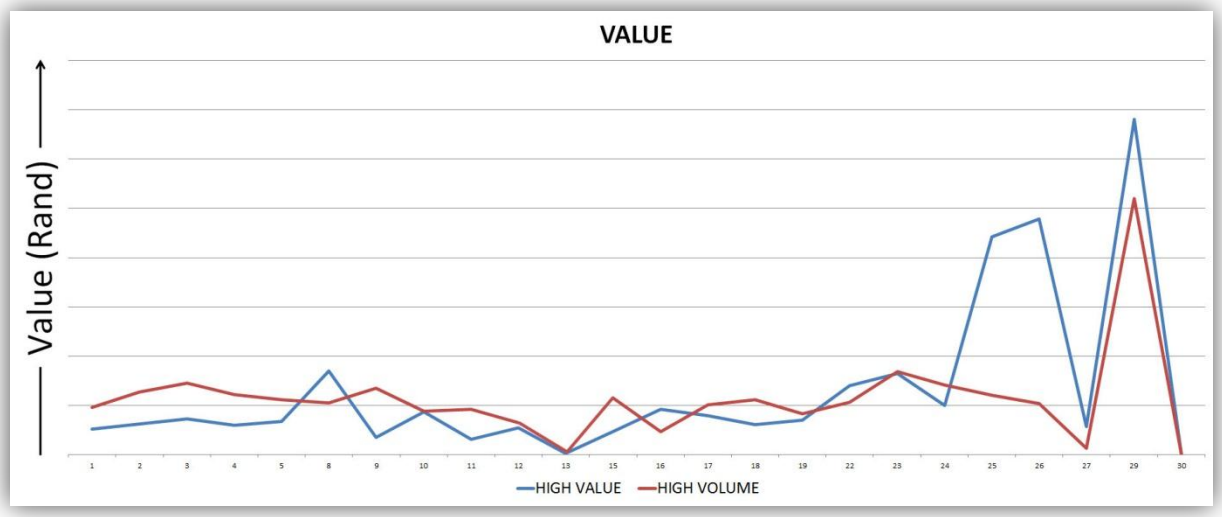


Figure 9: Value over Month Period between Product Classes

The following charts indicates orders on each specific weekday (Monday to Saturday); this analysis shows to difference between the VOLUME/VALUE SKU's when looking at delivery day frequencies.

Figure 10 and Figure 11 illustrates the amount of orders per weekday for the product class assignments both for VOLUME and VALUE respectively:

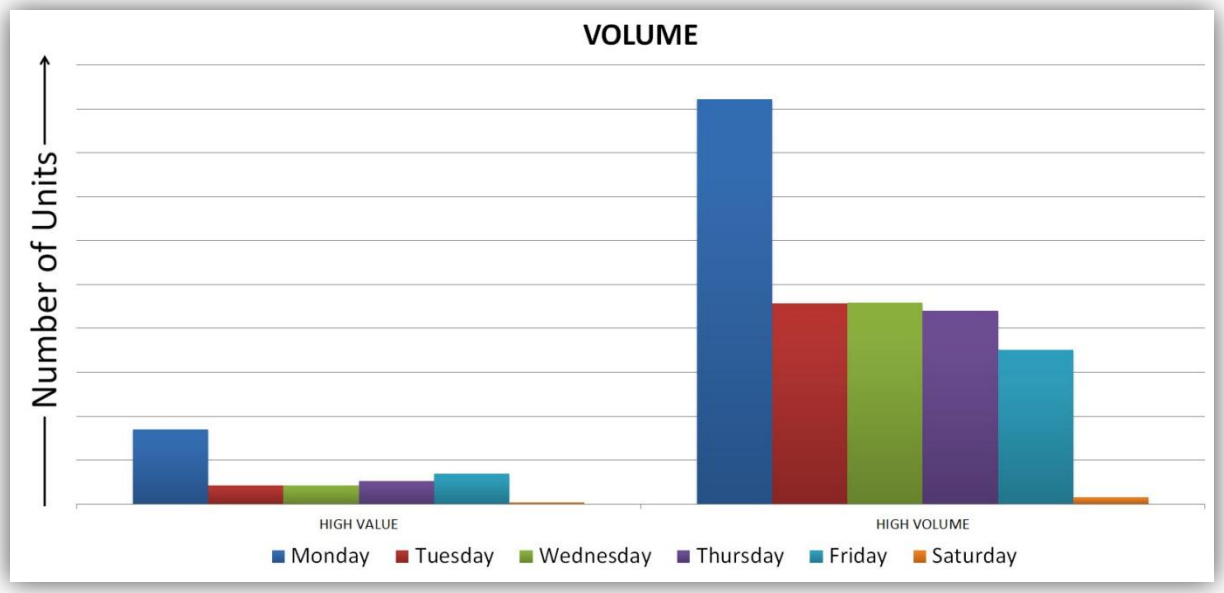


Figure 10: Volume for each Workday between Product Classes

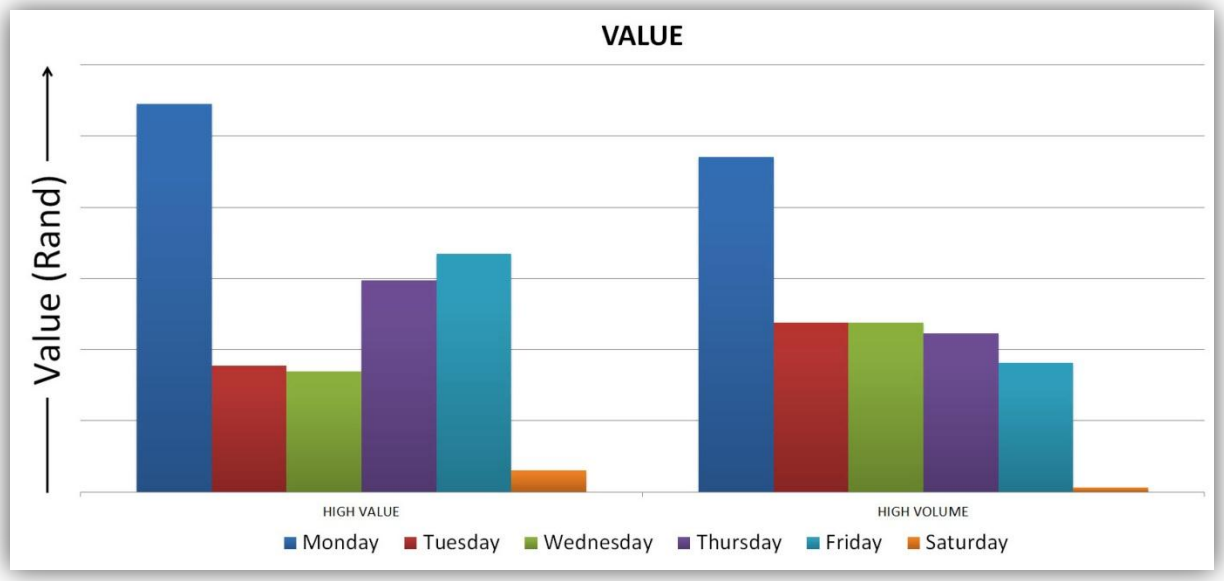


Figure 11: Value for each Workday between Product Classes

A clear trend emerges from the avialable information showing that a lot of orders are placed on Mondays with a steady decline towards the weekend for high VOLUME SKU's. High VALUE products seem to be a bit more ereactic and will, in such a way, influence the dedicated logistic services.

Studying the ordering pattern of products through the appropriate analysis, techniques such as "smoothing" can be developed and implememted. Smoothing refers to a method used when dealing with a distribution system that faces erractic order forcasts; measured for a certain period.

Smoothing allows the demand volumes to be delivered in a more constant manner as it takes forecasts into account and aims to buffer the large quantities of orders plased on a certain day.

Allocating predetermined Nominated Delivery Days (NDD) to customers and the distribution network alters the amount of drops that has to be made for a certain period. In turn, this effects the drop size, volume, value of products and the specidfied channel where delivery takes place.

4.2. Structuring the Model

Now that a quick initial data analysis overview has been done regarding the information that is available from the FMCG company, this reading can now go over to the gravity of this chapter which is structuring the Cost-to-Serve AS-IS model.

4.2.1. Assumptions

A number of intuitive assumptions have to be made in order to adjust more accurately towards the reality when calculating the Cost-to-Serve AS-IS (as well as TO-BE) model, namely:

- Cost-to-Serve amounts related to customer segments
- Fixed-Variable charge model (provided from IMPERIAL Distribution)
- Profit margins related to each SKU's VALUE
- Reverse logistics only applicable to wholesalers (NOT smaller retailers)
- Truck utilization (admin and loading costs)

These factors are considered when populating both the horizontal and vertical axis of the CTS model.

4.2.2. Cost-to-Serve Amounts

Cost-to-Serve amounts are determined through a fixed-variable charge model where customer channel distances influences the "variable" measure as specific costs will be assigned accordingly.

The fixed cost, of a specific delivery, is all the aspects apart from the variable travel distances; this entails that fixed costs will always be present and constant with a designated journey to customers.

The fixed costs are also influenced by the truck time utilization (actions that has to take place outside of travel) when delivering goods as described through the process diagram in Figure 12.

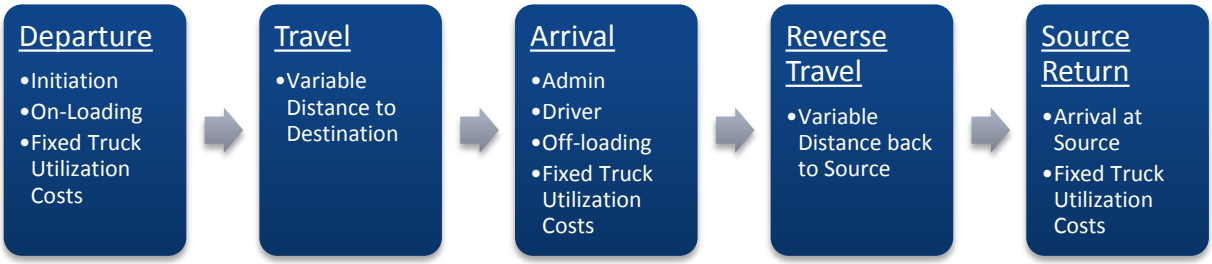


Figure 12: Truck Travel and Utilization Process

All these logistic activities amounts to the grand Cost-to-Serve totals and will differ from one customer channels to another; comprising out of fixed- and variable costs influenced by destination distances and delivery frequencies.

Each customer channel/segment is assigned a fixed-variable truck utilization factor (used in the data set) which is cost related in order to determine the CTS amounts. The following table shows an array of customer channels (assigned with a specific code) along with a channel description:

Table 7: Channel Assignments and Customer Segment Description

Channel	Description
A	These customers are grouped together as they are defined by the manner in which the segment sells and consumes the products directly from the delivery sites. Channel A is also distinguished as a main on-consumption area; deliveries to this segment usually occur more frequently and the customers are more likely to purchase and stock higher VALUE products in lower VOLUMES.

B	This customer pool operates in the same manner as channel A but deliveries are rather to occur less frequently and this clientele stocks most product types.
C	These customers are defined as larger SKU intake patrons such as **wholesalers** and consumption of the products does not take place on their premises. This segment is classified as a main area as it relates to the bigger delivery VOLUMES of most product types.
D	Operating in the same manner as channel C but in smaller VOLUMES with a higher delivery frequency rate. **Retailers** will most likely fall under this description of customer segments.

Each channel represents a certain amount of market share in the available information and was established through the number of occurrences in the data set. This aspect is better enforced on the actual Cost-to-Serve AS-IS model where the size of the dot shows the amount of market share ownership of said segments.

4.2.3. Profitability Aggregates

VOLUME and VALUE factors plays a vital role in this case study; as the vertical PROFITABILITY axis will be populated by totals generated from the VALUE column in the data set.

Specific profit margins for each product class are allocated accordingly; the VALUE figures consist out of total income; calculated as follow:

$$\boldsymbol{Profitabilty = VALUE \times \frac{Profit\ Margin}{(1 + Profit\ Margin)}}$$

Equation 1: Profitability from VALUE Equation

An educated guess (via a Microsoft Excel function) was made in order to determine the mark-up (%) of the SKU's because it varies due to discounts as well as customer channel order sizes and are indicated in the table below:

Table 8: Profit Margin Allocation for Product Classes

SKU	Description	Profit Margin
1	High VALUE – Low VOLUME	=RANDBETWEEN(40,55)
2	High VOLUME – Low VALUE	=RANDBETWEEN(12,20)

This formulation was run for all the data entries in the Microsoft Excel workbook and the profitability amounts were grouped together for each customer. These values were used to populate the vertical axis in the Cost-to-Serve AS-IS model for each customer channel.

Now that both aspects (logistic servicing costs and profit values) to the CTS model have been achieved a graphic analysis study can be done as in the next part of this section.

4.3. Identification of Design

The model will take the form of a Cost-to-Serve diagram which plot CTS monetary amounts against profitability and illustrates which customer channels to focus on in terms of improving their secondary distribution system in order to make said segment more profitable.

4.3.1. Cost-to-Serve AS-IS Model

This AS-IS analysis was run for the current situation being dealt with and will serve as the basic footprint for the TO-BE model in order to indicate the possibilities for potential change. Figure 13 shows the AS-IS Cost-to-Serve model for the customer channels (segments) being studied:

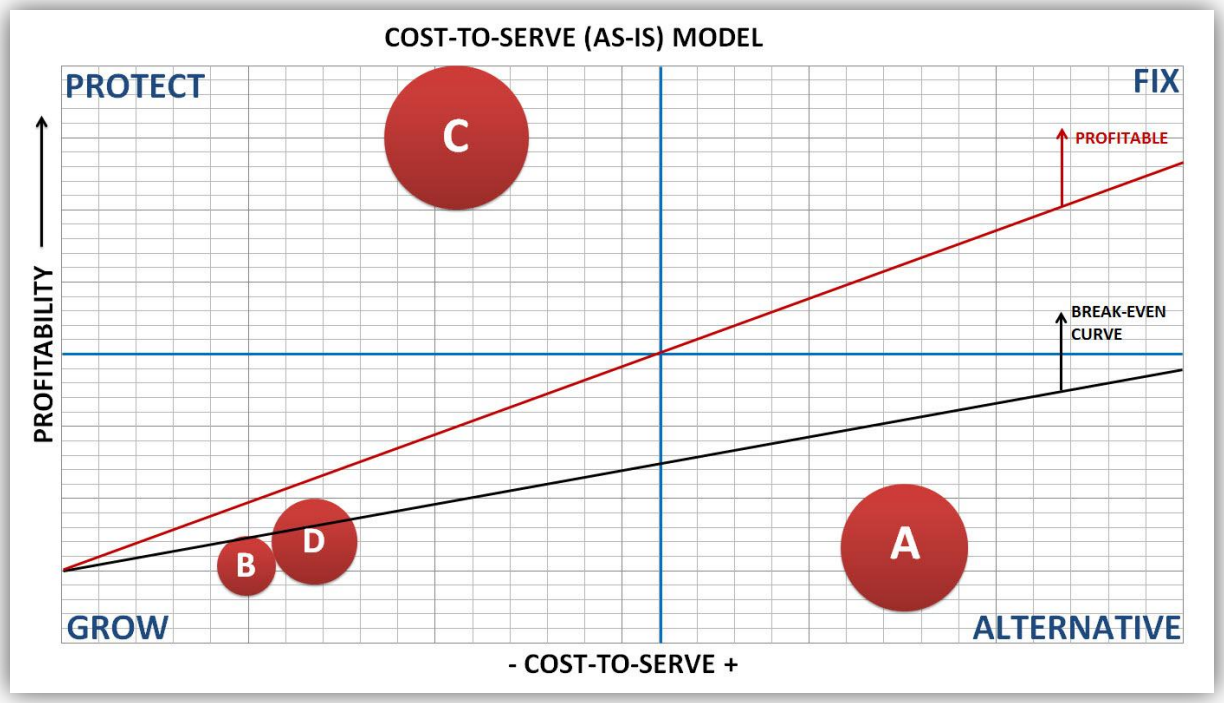


Figure 13: Cost-to-Serve AS-IS Model

It can be noted that customer channel C (wholesalers) has a high-profitability and lower Cost-to-Serve position; this is the optimal situation and the proposed RTC strategies will closely resemble the current service packages employed at this segment as well as aim to elevate it even more.

An unfavourable situation is currently taking place with customer segment A, as it holds the second largest market share for one, and it has a low-profitability with high Cost-to-Serve amount on aggregate average.

This is entirely the opposite of what optimally is required; a critical analysis study definitely has to be performed in order to identify how the service packages has to be altered in order to achieve the most beneficial secondary distribution system elevating this segment to a more favourable position.

4.3.2. Route-to-Consumer Strategy Proposal

If a certain customer channel type is selected along with the specific distribution system and product specifics; it comes to a Cost-to-Serve value that can be used in the CTS modelling phase of the project, leading to how management should go about Route-to-Consumer strategies with results and recommendations.

This model approach will be developed extensively; primarily concentrating on Cost-to-Serve modelling characteristics of servicing the various customer channels in order to better determine activity based distribution costs.

4.4. Section Summary

This chapter linked up the two sections that initially discussed how a Cost-to-Serve model works and went over into a "Data Analysis" study in order to apply the techniques for the current AS-IS system.

A comprehensive understanding towards what the actual situation was formed and from here a clear forward approach can be developed in order to build an appropriate TO-BE system.

The next section on "Design Concept" concentrates on answering the question of "SO WHAT?" (is there any use in this?) and aims to employ the correct strategies in order to alter the secondary distribution system to a more favourable as well as profitable manner.

5. Design Concept

This project phase promotes the idea of the Cost-to-Serve TO-BE model through the appropriate and realistic implementation strategies for an optimal Route-to-Consumer framework; which encompasses all the logistic service practices.

5.1. Critical Analysis

It all comes back to what the objectives of this projects is; the aim is to develop customized Route-to-Consumer strategies for a dedicated logistic service; to be implemented upon the various customer channels in order to benefit from doing so.

5.1.1. Aim of the Cost-to-Serve Model

Robot colours in Figure 14 shows the steps toward the preferred TO-BE distribution system inevitably elevating all the customer channels/segments to a slightly higher profitability, as well as a low logistic activity based Cost-to-Serve state:

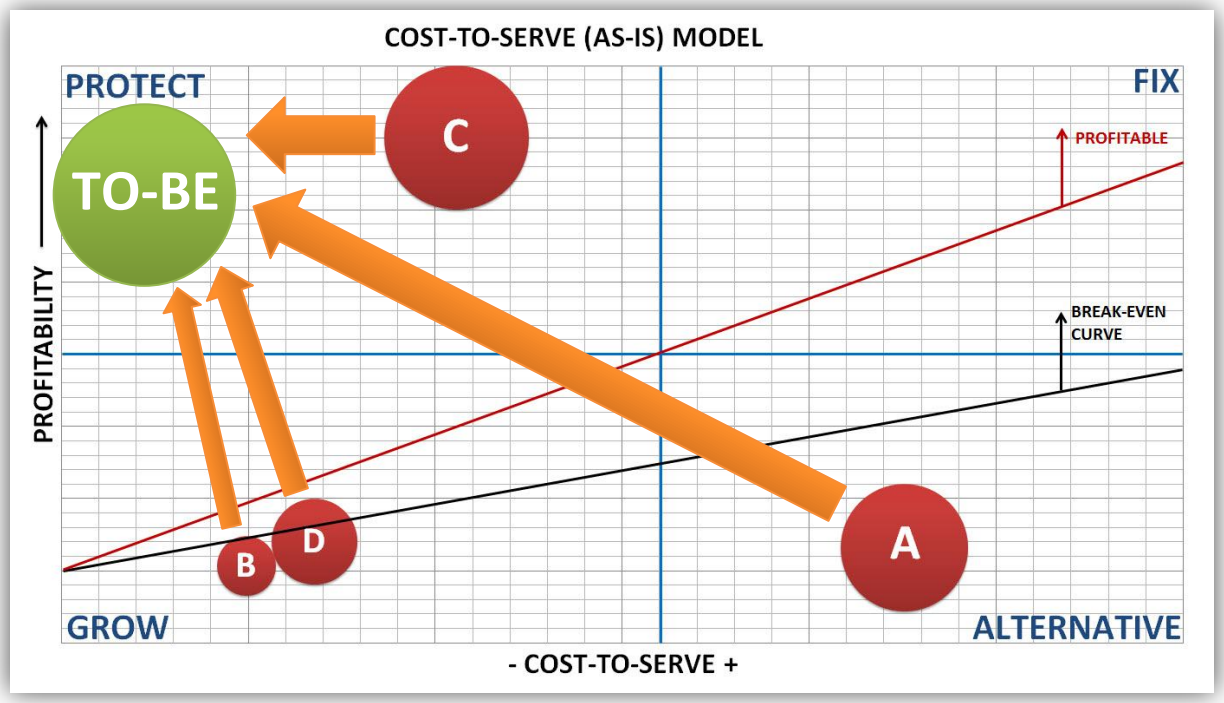


Figure 14: Aim of the Cost-to-Serve Model

Figure 14 is based on the concept of a CTS model as referred to in the section on "Selection of Appropriate Methods, Tools and Techniques" and indicates the four distinct quadrants which classify the individual customer channels. Furthermore, the diagram contains diagonal lines for both profitability and break-even curves shown in red and black, respectively.

A break-even point on the chart means that the customer channel has the exact same monetary value for profitability as well as for Cost-to-Serve amounts. The profitability diagonal was taken to be twice the financial value it takes to service a certain segment.

5.2. Problem Solving Approach

From all the available information it is clear that some delivery areas take up more market share. As mentioned before, logistic activity costs in the FMCG industry relates to the frequency of drops per customer segment rather than the variable distances travelled to the final destination.

Table 9 indicates the average number of drops per month to a certain customer segment determined from the position on the CTS model. The table also contains robot colours relating to the CTS quadrant that the channel falls in, showing which areas to concentrate on:

Table 9: Average Delivery Frequency per Customer Channel

Channel	Average Delivery Frequency (per month)	Cost-to-Serve Quadrant	Robot Colour
A	12	ALTERNATIVE	
B	4	GROW	
C	8	PROTECT	
D	6	GROW	

The major reasons affecting the number of drops to a certain customer channel are:

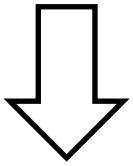
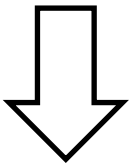
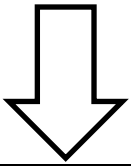
- Frequency of customers placing the actual orders
- Order sizes relating to SKU VOLUMES and VALUES
- Region disposition and Nominated Delivery Days (NDD)
- Truck capacities (relates to truck types and sizes)

5.3. Solution Development

To illustrate a solution approach the assumption is made that each separate customer channel uses a universal truck size with a finite capacity. Each classified customer channel is also the same distance from the distribution centres on aggregate average. This enforces the understanding that the frequency of drops determines the accumulative Cost-to-Serve amounts effecting profitability.

Table 10 shows what happens to the frequency of drops, influencing the logistic service costs (CTS amounts), as well as the impact on profitability when implementing a proposed strategy to the different customer channels. This also serves as the recommendation framework for the project:

Table 10: Possible Strategies to change Cost-to-Serve AS-IS Model

Strategy Name	Business Component	Description and Aim	Delivery Frequency	Cost-to-Serve Amount	Profit
A	**Distribution**	Sorting deliveries for certain period, from large to small orders, then to allocate bigger trucks first; breaking up the size of orders in the best way. Methods to use include route optimisation, smoothing and NDD alignment.			
B	**Distribution**	Segment C (as in the CTS AS-IS model) needs to become the preferred standard and means obtaining more wholesalers or redistributors as customers. Maybe even for ID to open such facilities operating in the same manner.			
C	**Sales & Marketing**	Implement promotional or discount strategies for the specific customer channel to place larger orders, and less frequently.			

These strategies/recommendations will influence the critical success factors, therefore values in the data set can be adjusted accordingly in order to illustrate what happens to the Cost-to-Serve TO-BE model. Robot colours in the above table indicate the amount of change (red – low, green - high).

5.3.1. Growth Strategies

Another recommended approach towards a solution, from a Cost-to-Serve (GROW) point of view, might be the alignment of the market base. These customers can be improved by increasing the revenue while maintaining costs. This can be achieved through the following opportunities:

- **VERTICAL** (selling more volume of the existing product range) and/or
- **HORIZONTAL** (increasing the customer base/market footprint; maintaining volume)

It would be up to management to decide which way forward is best; implementing one or both of the above options. The diagrams below (Figure 15 and Figure 16) illustrate what the result is when expanding the customer base; either with a vertical or horizontal alignment procedure:

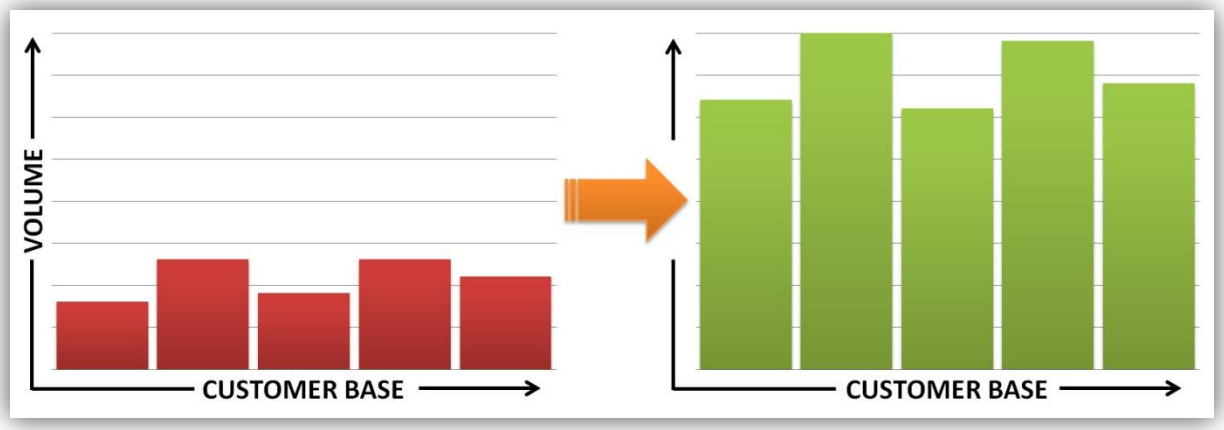


Figure 15: Vertical Customer Base Alignment

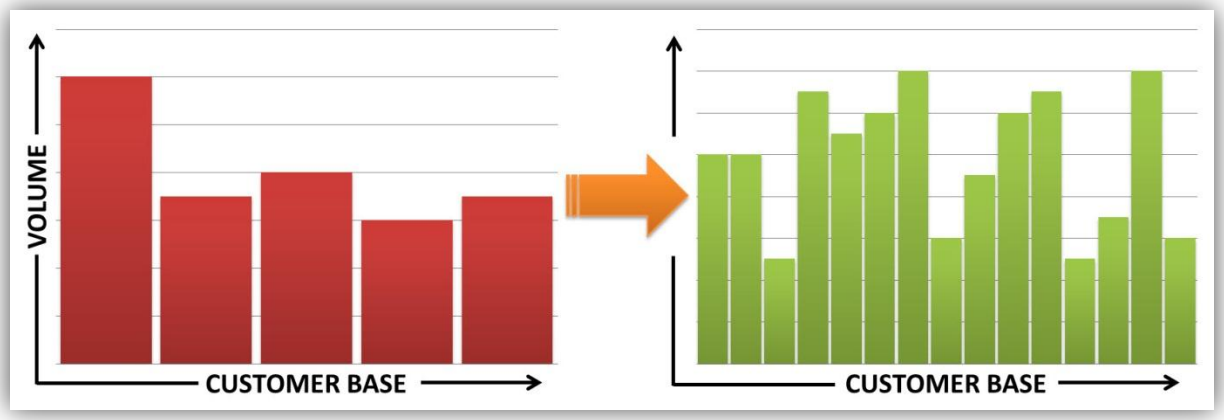


Figure 16: Horizontal Customer Base Alignment

5.3.2. Cost-to-Serve by Product Volumes

Another way of looking at the Cost-to-Serve design concept can be by pivoting the different entries in the data set in order to produce other useful analysis options. If the client of IMPERIAL Distribution would like to run the CTS model with additional inputs, such as their product range for a certain period of time, it can easily be extracted from the available information.

The following diagram (Figure 17) illustrates how an analysis study can be performed and graphically represented regarding the VOLUME (number of SKU units) vs. their Cost-to-Serve amounts. In this instance it is useful to see which SKU's retains the most logistic costs in the distribution system:

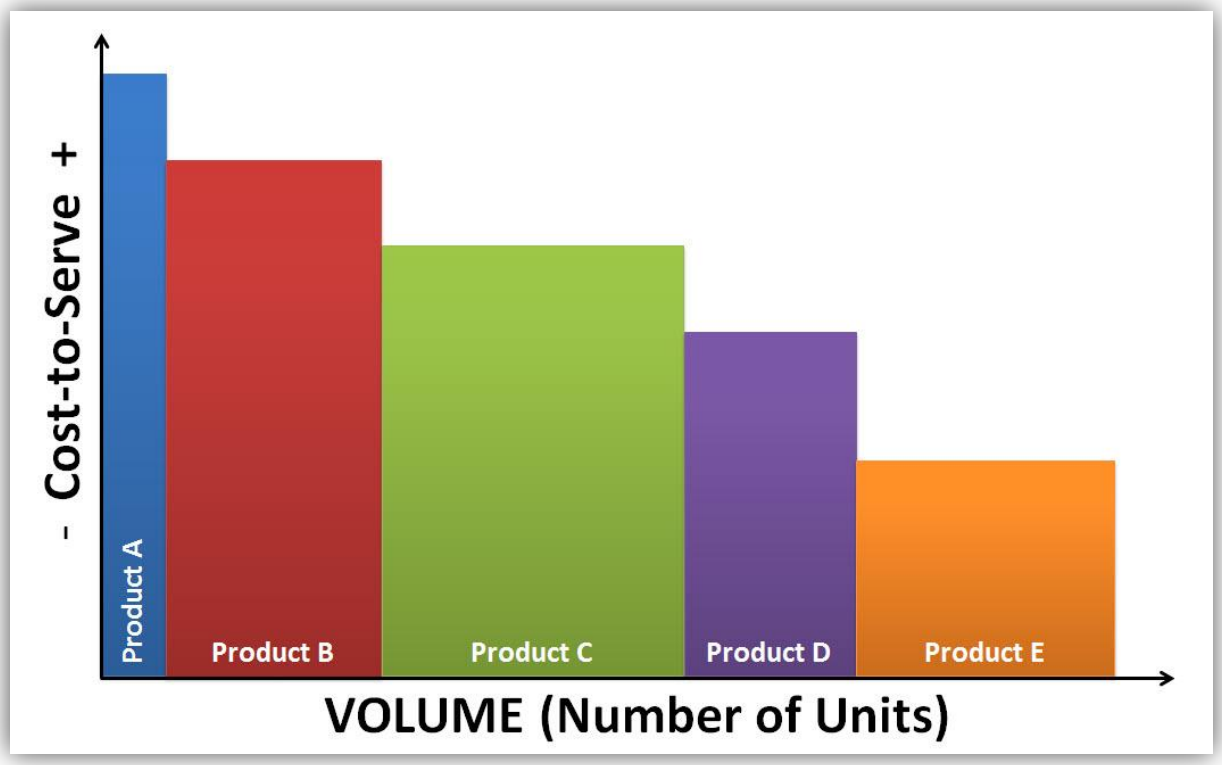


Figure 17: Cost-to-Serve Measured by Product Volumes

The area of each column in the above diagram also means the amount of accumulative VOLUME that the product holds. Product A, therefore, will possibly be viewed as a low VOLUME – high Cost-to-Serve entity and most likely consist out of high VALUE goods. Measured against a product that has high VOLUME with low Cost-to-Serve amounts which, in turn, might be low VALUE SKU's.

5.3.3. Consumption Junctions

This strategy approach is in the form of a tool that will assign a "Consumption Junction" order within the transactional data set for a future period. A Consumption Junction (CJ) can be defined as three or more delivery destinations located within close proximity of each other.

In order to illustrate this initiative a map extract of the greater Hatfield (Pretoria) area was selected to show where the Consumption Junction hotspots possibly may lie. Figure 18 shows delivery locations (red dots) along with a proximity indication (encircled red ovals); a CJ is identified when three or more proximity lines cross each other:

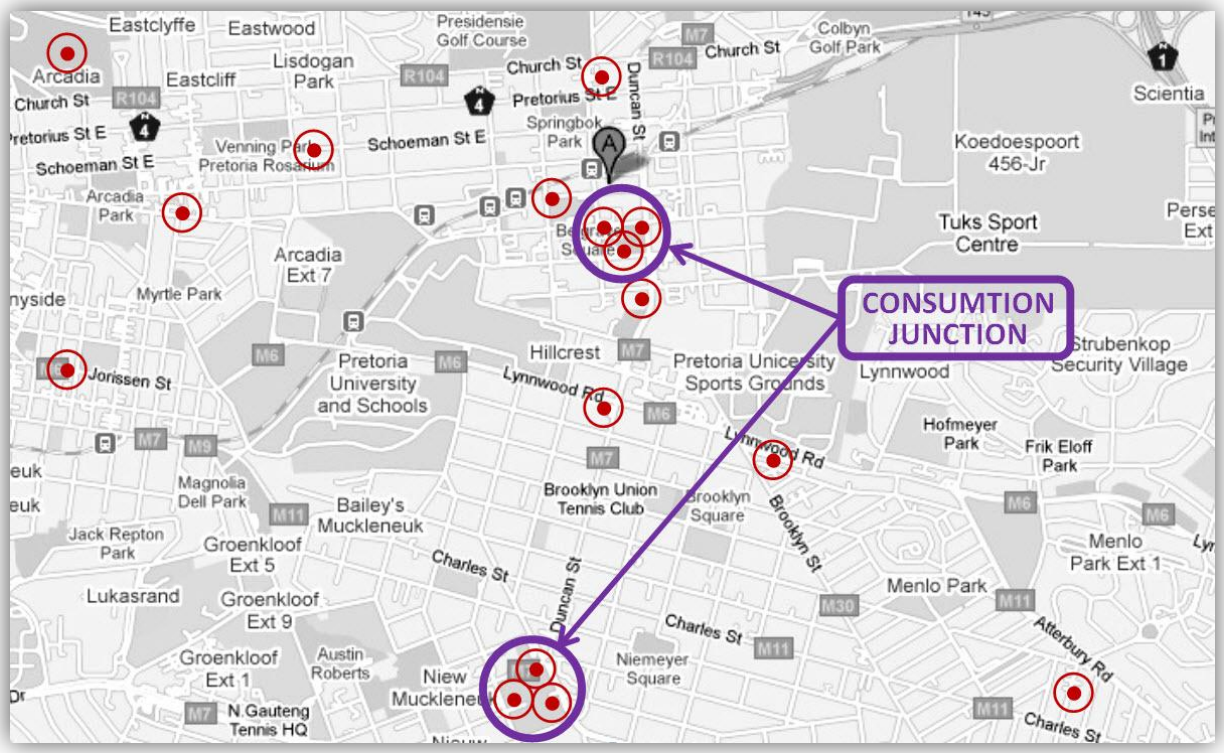


Figure 18: Consumption Junction Strategy Approach

This solution will be beneficial when dealing with the following aspects in the distribution system:

- Dispatch operations and workshop scheduling (per cluster)
- Lowering delivery frequency
- Optimal order grouping
- Warehouse picking

5.3.4. Channel Definitions

The way in which to serve the different final customer destinations is important and should be handled in the proper manner along with the appropriate secondary distribution interfaces. This can be achieved by assigning detailed channel definitions to each consumer; classifying them in the appropriate pool of customer channels.

A manual describing business process models for deliveries to the individual customer channels is suggested as this will form part of the proposed service packages. This user defined procedure will be used by all employees responsible for executing the operation to the final customers.

Furthermore, as FMCG industry expenses are rather affected by the number of drops along with time constraints, the strategy of implementing redistributing facilities is strongly recommended.

5.3.5. Cost of the Solution

This project was initiated to benefit all the parties involved with a Cost-to-Serve analysis study which indicates the redundant logistic expenditures and recommends possible improvement strategies. All the stakeholders involved with this initiative include IMPERIAL Distribution, ID's clients and the FMCG industry partners.

Route-to-Consumer strategy packages are developed because it is the right thing to do; saving costs and increasing revenue for all. In this way lasting commitments are founded and the base for long-term relationships are set.

The cost of the solution, therefore, is measured against the mutual gain and profitable benefit that all the organisations involved will achieve at the end of this venture.

5.4. Application Testing

In order to simulate what would happen to the Cost-to-Serve TO-BE model the available information was altered; according to the actions that would occur if the strategies from Table 10 were to be implemented into the current distribution system as well as the sales and marketing components.

5.4.1. Cost-to-Serve TO-BE Model

The sensitive information in the data set was modified for modelling purposes; Figure 19 illustrates the appropriate changes made to the CTS model affecting the TO-BE system:

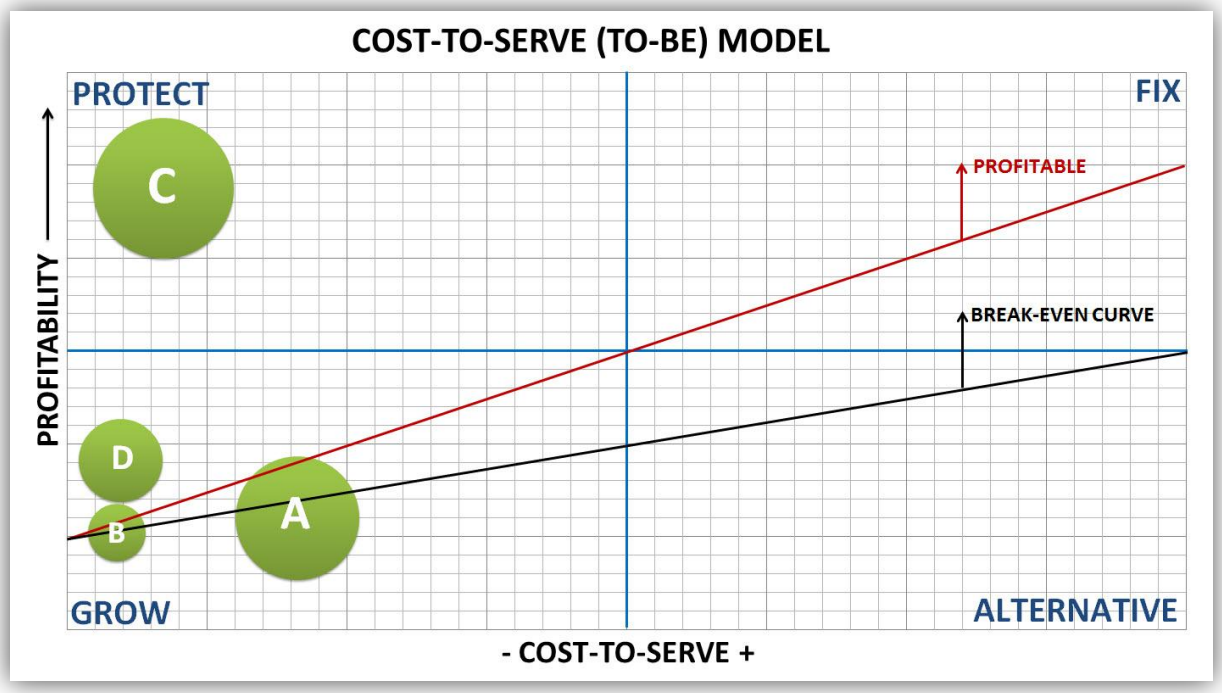


Figure 19: Cost-to-Serve TO-BE Model

The TO-BE CTS model illustrates what happens to the individual customer channels if the data was altered accordingly and, as it can be seen, the customer segments has shifted towards more favourable positions on the Cost-to-Serve quadrant graph.

It can be noted that the customer channel market shares has moved significantly in a left-horizontal direction and some only becoming slightly more profitable. This can be devoted to the fact that most of the strategies were focussed on distribution; influencing the Cost-to-Serve amounts.

5.5. Model Implementation

The proposed strategies can be suggested to the FMCG partner at this stage for them to implement into their distribution and marketing processes in order to test the suggested methodologies. Tools can now also be developed to show the amount of change that was achieved with the said implementation; an example of such key measurement analysis is shown in Figure 20.

The general Cost-to-Serve model can also indicate which customers (including channels/segments) are currently being serviced in an unprofitable manner; the below diagram illustrates how this accumulative concept is analysed with a Customer Channel vs. Profitability graph:

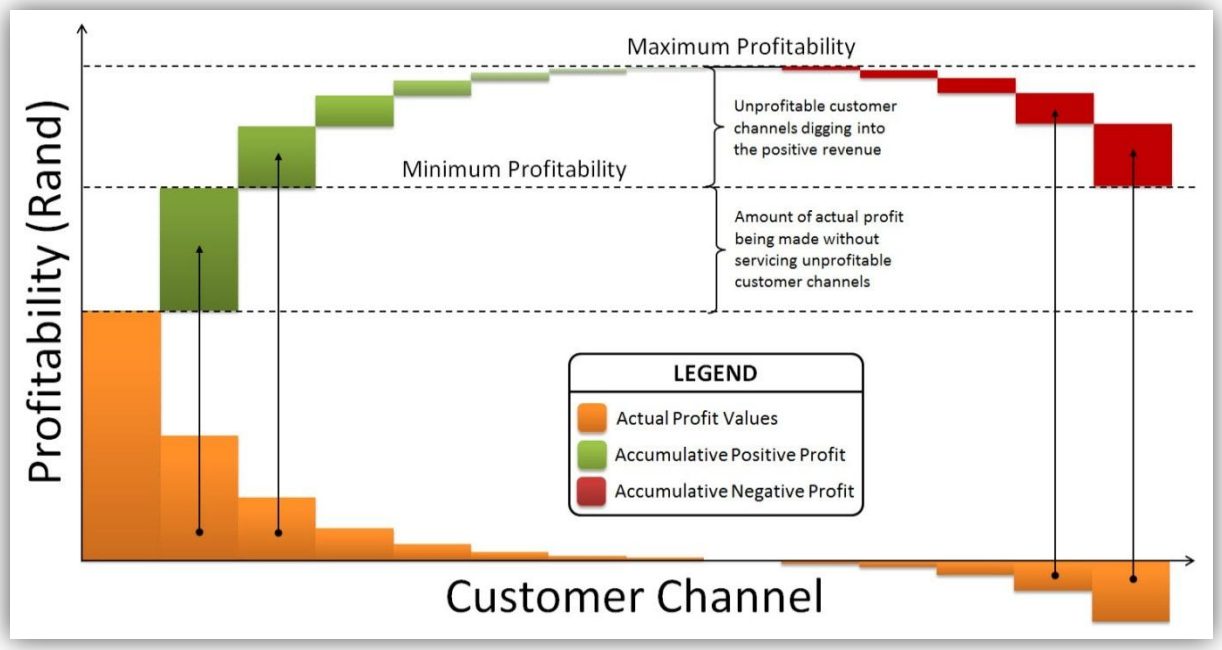


Figure 20: Cost-to-Serve Measured by Customer Channels

This model approach is useful as it firstly sorts all the customer channels from highest profitability aggregates to lowest; thus also serving as a ranking table indicating which segments are most lucrative as well as pointing out which unprofitable channels are currently being serviced.

The chart also shows the amount of actual profit being made without servicing unprofitable customers. The negative accumulative profits of certain customer channels are, in turn again, lowering the already achieved revenue.

5.6. Section Summary

The chapter on "Design Concepts" concludes the reading of this dissertation with elements such as critical analysis, problem solving approaches, solution development, application testing and model implementation being discussed in detail under their said headings.

This section also covered the recommended strategy framework for areas of possible change and improvement opportunities; in essence the aspects that has to be altered in order to optimize the secondary distribution system of the client of IMPERIAL Distribution.

The rest of this paper consists out of a quick overview of the entire project in the form of the "Conclusion and Recommendations" section, followed by the Bibliography and Appendices.

6. Conclusion and Recommendations

The aim is to develop customized Route-to-Consumer strategies for a dedicated logistic service provider, to be implemented to the various customer channels, in order to benefit from doing so.

6.1. Conclusion Summary

The project will be done for IMPERIAL Distribution in conjunction with one of their existing clients in order for the topic to execute the requirements of a final year project and to add real milestones that are business driven.

6.2. Research Document Highlights

The final objective of the project is to produce a conceptual model to service ID's client's customers in order to achieve cuts in unnecessary expenditures whilst improving service levels.

Clearly two goals that stands apposed towards each other, but this challenge is both interesting and if approach correctly the paradigm shift will occur; for the direct linear logistic costs versus customer satisfaction trend to transform into an indirect linear pattern following the "Best of both Worlds" idealistic. (Christopher, Martin and Gattorna, John 2005)

The research and information covered in this report (Literature Review) has a very broad spectrum of aspects that has to be taken into account as it is influential factors within the scope of the project. This leads to the next section (Selection of Appropriate Methods, Tool and Techniques) of the report that describes the reality of the current problem faced by IMPERIAL Distribution and where there are possible room for improvements.

6.3. Review of Project Milestones

In essence the project will lead to a Cost-to-Serve (CTS) analysis study, being the gravity of this entire exercise, and followed by the possible implementation of an optimal Route-to-Consumer (RTC) strategy package developed against the appropriate measures proving to be profitable.

The project mainly looks at the Distribution Network of the Fast Moving Consumer Goods (FMCG) industry partner being studied and aims to better develop the routing characteristics of the current system in order to achieve mutual gain. Primary and especially Secondary Distribution plays a significant role in the features of this project.

Data analysis will be acquired through a RFI (Request for Information) file from the industry partner; the conceptual design will then be populated with this data and be changed/modelled in order to generate the appropriate alternatives. From here the actual solution will be developed.

6.4. Recommendations

The crucial question that will be asked in the project is: What is the best possible secondary distribution system that can be set in place for the various customer channels that will elevate "ALTERNATIVE" customers to a "PROTECTED" level in the CTS model?

The objective also includes looking at "PROTECTED" customers for potential improvement opportunities in the event that their current distribution system can be better optimized and quite possibly be mixed up in a more profitable manner.

The way in which to approach this task will be from a financial outlay and analysis perspective; highlighting activity-based logistic costs will enable the project to yield outputs from the CTS model and gain insight for management to choose best possible Route-to-Consumer strategies.

6.5. Final Conclusion

Companies have a lot more potential to be profitable when accurately understanding logistics activity costs. This can be achieved through cost savings by developing Route-to-Consumer strategies with a Cost-to-Serve analysis study; altering the secondary distribution system by applying the correct customer channel/segment service packages.

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Appendices

Appendix A: Specific Data Pools and Headings; describes the data (pools and headings) obtained from the company's database. Transactional data from the FMCG industry was taken over a one month period in their financial year containing a number of entries in each line.

Table 11: Specific Data Pools and Headings

Data Pool	Data Headings	Description	
CUSTOMER	Customer Code	Identification code assigned to specific customer in database (integer)	
	Customer Description	Name of customer (string)	
CHANNEL	Segment Code	Identification code assigned to specific customer in database (integer)	
	Segment Description	Name of segment/customer channel (string)	
SOURCE	Depot	Source location from where SKU's are being shipped; taken over a specific region (string)	
INVOICE INFORMATION	Invoice Code	Identification code assigned to specific customer in database (integer)	
	Invoice Description	Type of invoice that were processed influencing the delivery manner (string)	
	Invoice Date	Day on which transaction took place; taken over one month and important in analysis phase – distinguishing between weekdays	
PRODUCT & MATERIAL SPECIFICATION	Material Code	Identification code assigned to specific customer in database (integer)	
	Product Mater Description	Exact product specification (including name and size) regarding SKU (string)	
	Product Assignment	Classification codes created for specific product groups regarding quality/value and volume	**High value – low volume products**
			High volume – low value
	Material Type Assignment	Product specific assignment codes to further distinguish between different types (integer)	
	Material Type Description	Product specific category described (string)	
STOCK KEEPING UNITS	**VOLUME**	Amount of ordered product delivered to customer per invoice transaction (integer)	
	VALUE	Net worth (income) related to transaction	
	Returnable	Flags if SKU is returnable – reverse logistics (Boolean expression)	
DATES	Day	Day number of month (integer)	
	Month	Specific month of transaction (string)	
	Year	Year of data entry (integer)	
	Weekday	Day of week: Monday - Sunday (string)	