MEASUREMENT OF CUSTOMER QUALITY AND SERVICE REQUIREMENTS IN A PAPER CONVERTING COMPANY

BY

DOUGLAS MELVIN WALLACE

Submitted in part fulfilment of the requirements for the degree of

Master of Business in Manufacturing Management

in the Faculty of Business

Victoria University of Technology

(St. Albans Campus)

1995

MEASUREMENT OF CUSTOMER QUALITY AND SERVICE REQUIREMENTS IN A PAPER CONVERTING COMPANY

CONTENTS   PAGE

CONTENTS

CONTENTS

TABLE OF ILLUSTRATIONS

CONTENTS

ACKNOWLEDGEMENTS

ABSTRACT

Research into customer service in the manufacturing industry has lagged behind that in service industries, where superior service quality is the most important strategic priority and companies that focus on their customers will build a loyalty that will preclude competitors. In the service industry, customer service needs to be designed for the particular product and process, with measurable outcomes that deliver the results of consumer research.

In the manufacture of consumer goods, the product needs to be augmented by customer service factors which fall into the areas of design activities to enhance physical quality, as well as non physical or service activities such as response times, delivery, installation and after- sales repairs. However it is dangerous for a company to try to compete by offering superior service on all dimensions simultaneously and trade offs must be made based on appropriate consumer research.

The overall objective of this research was to provide strategic direction for improving quality and customer service in the paper converting industry. The research achieved that aim by determining the requirements of quality and service for different customers, different products and market segments, through a newly extended process which obtained feedback from corporate customers and two groups of end users, those purchasing premium products and those purchasing low cost products.

In the business being considered, surveys had already been conducted by semantic network analysis and gap analysis by market research consultants. This research carried out additional surveys and compared them with those already available. The present research employed a cross-sectional causal field experiment using two questionnaires. Because responses were obtained from both national intermediary and representative napkin end users, each survey had a common core, applicable to all respondents and individual sections for corporate customer and end users.

As a result of the surveys, it was concluded that considerable differences existed between intermediary users and end users in:
  - their ranking of elements of quality and customer service,
  - their ranking of the technical aspects of quality and,
  - their evaluation of the suitability of a napkin for their use.

A series of specific differences were found, of which the most important are:

- all the customers expect quality and there are no significant differences in their views, but low series napkin users have lower quality expectations.

- premium product users require a wider range of napkins than corporate users, who have their own specific narrow range, and low cost users who expected a limited choice.

- corporate customers want better stock availability and full quantity deliveries at the exact time and day specified.

It was concluded that the detailed surveys, in the present research, had greater validity than previous ones because they covered a wider range of customer requirements, not limited to those already being offered. The research made a series of recommendations about, for example, softness and embossing standards in manufacturing, which it is hoped will be adopted. The aim, to obtain feedback across the whole range of customer requirements for future strategic direction, had been achieved.

TECHNICAL TERMS / WORDS

The following is a list of technical terms or words with which the reader may not be familiar. They are listed in the order in which they appear.

Bowater Deeko (Deeko): the division involved in the food service industry, concentrating on single use products for the tabletop, i.e. paper napkins, plates, place and tray mats, table-covers and doyleys, plastic plates, cutlery and glasses.

Bowater Industries Australia (BIA): the corporation controlling and coordinating the activities of a number of wholly or partially owned strategic business units.

Table top products: A range of products manufactured and marketed specifically for the food industry/ food service business. The range includes colour or design coordinated products which complement each other.

Semi structured group discussion: A group of people who met specific selection criteria, led in a group discussion by a group moderator. This technique allowed the participants maximum opportunity to spontaneously raise issues of most interest to them. At the same time, the technique provided the group moderator with a forum in which to explore any points that had not been raised spontaneously and required further probing.(Consensus Research, 1991)

Semantic network analysis: Semantics is a study of the meaning of the relationships that exist between word signs and the entities to which they refer. Semantic network analysis is the system which allows the tracing of the meaning of words in terms of the deep meaning structures that people bring to word symbols and the inter-relationships between those words. (Consensus Research, 1991)

Footprint: The area of the market place in the food service business which a product is sold or marketed. Different brands have different market place niches or footprints which may or may not overlap. If the footprint of dissimilar products are found to overlap, a business opportunity for complementary product sales may exist.

Generic products: Products sold by supermarket chains as their own or "house" brand as distinct from branded products which are manufactured and marketed by independent companies. Usually, a manufacturer will manufacture and sell both their branded product and the particular supermarket generic product to each supermarket chain.

Bowater Tissue (Tissue): The division involved in supplying rolls of raw material (tissue) to the paper converting industry, as well as marketing finished products such as toilet rolls, facial tissue and paper towelling.

Sancella: The division involved in the supply of feminine hygiene and personal incontinence products. Sancella is a joint business venture between BIA and the Molynecke Corporation, Sweden

Tissue / tissue paper: A specific type of paper, usually in the grammage (weight) range of 15 - 30 grams per square metre (gsm), compared with bond paper which has a grammage of from 40 - 45 gsm. Tissue is normally supplied by the paper mill in reels of widths, diameters and plies to suit the customer.

Tissue plies, 1 ply, 2 ply, 3 ply: A reel of tissue containing a single layer or ply can be converted into a napkin, called a 1 ply napkin. The paper mill can "ply up" reels of tissue either during the paper manufacturing process or as a downstream operation and supply multiple ply reels. Depending on the number of plies in a reel, these are converted into 2 ply or 3 ply napkins.

Napkins, cocktail, luncheon, dinner: The use of the napkin dictates the name and usually the size, typically:

  Cocktail: approximately 220 - 230 mm square.
  Luncheon: approximately 315 - 320 mm square.
  Dinner: approximately 410 - 420 mm. square.

depending on the manufacturers equipment and marketing strategy.

Sami: The retail grocery industry sales and marketing intelligence system. A computerised system for analysing sales in the supermarket industry and available to companies by subscription.

Price fighter brand: A product marketed deliberately at a low price either to build or defend market share. The product may or may not be sold at a price lower than its manufactured cost.

A.T.Q.R.: Australian Total Quality Research. A company associated with Victoria University of Technology, Melton campus, who conducted the research survey and interviews.

Pulp, virgin, recycled: Paper is made from pulp comprising wood fibres. The wood is broken down into pulp either mechanically (mechanical pulp) or chemically (chemical pulp). A pulp comprising all virgin wood fibres is called virgin pulp. Pulp comprising wood fibre and recycled paper is called recycled pulp. The percentage of recycled paper added to the pulp is dictated by the end use or market.

Crepe: A feature occurring in all tissue manufacturing to a degree. Wet paper is transferred from the (endless) wire carrier at the wet end of the paper making machine onto a roller which is used to remove water from the paper. The paper is then removed from the cylinder by a doctor blade which scrapes the paper from the roller, wrinkling it slightly in doing so.

Web: The term used to describe the paper after manufacture and refers to the continuous sheet of paper passing through a machine, i.e. a reel to reel print machine will print on the web. A sheeting machine, with the web passing through the machine produces cut sheets.

R.O.I., Return on investment: The return in dollars (profit), divided by the funds (dollars) invested, expressed as a percentage.

End User: The ultimate user of the product, who uses it for the purpose of which it was intended.

Intermediary User: Defined as one who may specify the product and purchase it from Bowater Deeko, but does not actually use the product, being either:

- A company who acts as a distributor for Bowater Deeko who on sells the products to caterers or retailers of food.

- A company who includes the napkin as part of a sale to an end user as part of their product or service, e.g. McDonalds, Hungry Jacks, Qantas, etc.

DEFINITIONS.

Quality: The term used to define the physical characteristics of a product which can be translated into measurable objectives and outcomes in a manufacturing environment.

Technical Aspects of Customer Service: That aspect of customer service to do with the correct procedures and practices involved in delivery of customer service to a customer :- "Were things done correctly?", refer sections 1.1, 3.2.2 and 4. (Bowen, Siehl, Schneider, 1989, p78)

Relational Aspects of Customer Service: That aspect of customer service dealing with the relationship between the supplier and recipient of the service: "Was the customer treated properly?", refer sections 1.1, 3.2.2 and 4.(Bowen et. al., 1989, p78)

Service: The term used to define non-physical characteristics of a product supplied to a customer, often perceived as being part of "quality" by the customer.

Product Group: A group of products with similar characteristics which have been grouped together by Bowater Deeko for convenience in marketing, analysis and for reporting purposes.

1 INTRODUCTION

Changes in the perception of physical product quality have occurred over the years and are an ongoing process. As customers become used to superior quality, their tastes and attitudes change, placing ever changing challenges to business to continue to remain profitable in the manufacture and marketing of goods and services.

Quality is linked with customer service and is only effective if based on feedback from customers. The process of satisfying a customer is a strategic choice, an ongoing process which involves cultural change.

Bowater Deeko, a division of Bowater Industries Australia (BIA), is a paper converting company, specialising in providing "table top" and speciality medical products, catering to a range of customers which include retailers, wholesalers and other manufacturers or service providers. The industry is a mature one, characterised by dominant standard designs, high volume production, few manufacturing companies and competition in the form of price and dependability. (Adam & Ebert, 1989, pp 109).

Other issues inhibiting the development of relevant standards were the large and complex product range and the logistic channel length and complexity. A different strategy to quality and customer service was required as the existing quality standards had resulted in unnecessary waste and high manufacturing costs, or customer complaints. There was a need to understand specific aspects of quality for different products and the implications these had for manufacturing.

The main objective of this research was to develop a process of obtaining feedback from both corporate and end users of napkins, so that more relevant manufacturing standards for production and supply could be implemented. This would improve the profitability of the company and customer service by improving delivery time due to better manufacturing capability and the resultant capacity availability. Direction for future company strategies to improve quality and customer service in the paper converting industry was also to be provided.

A review of available literature on quality and customer service in both the manufacturing and service industries was conducted. The academic research in this thesis proposed and tested questions about the customer and the internal customers

understanding of quality and service parameters. Following a number of pilot studies, two instruments were developed to obtain data from a number of respondents on a range of issues related to the technical aspects of quality as well as to a number of questions related to customer service. Responses were analysed and compared, tabulated and summarised, followed by a series of recommendations.

On successful completion to the answers to these questions, there were business reasons which required that the findings of this research be implemented in specific areas. This implementation was developed in Section 9, Postscript, but does not form part of this research.

1.1 History

Previous research at Deeko had concentrated on products overall, with no understanding that there may exist specific relational aspects of quality and customer service for different products, which would have implications for manufacturing operations. Marketing surveys had been conducted but, prior to 1993, no surveys important to manufacturing had been conducted to determine customer perceptions of the quality of table napkins, because it was seen to be too difficult a task. A review of these surveys follows.

1.2 Relevant Surveys

1.2.1 Marketing brand survey

In 1991, the Marketing department conducted a brand audit (Consensus Research, 1991) to build a more detailed analysis of the consumer psychology by examining consumers' perceptions of what the Deeko and Scott brands represented. This survey, conducted in Melbourne and Sydney, was a qualitative study using semi-structured group discussion, specifically using the Semantic Network analysis technique. The survey was conducted to determine:
- the meaning of Deeko and Scott brands to groups of users and non-users of the brands.
- whether there was an overlap in the footprint of the brands from the consumers point of view.
- the marketing areas in which each of these brands could be extended.

The interest in this survey for this research was due to the Deeko and Scott brands being set at opposite ends of the market place spectrum. Whilst both were branded products, as distinct from generic products, the positioning of the Scott brand was in direct competition with many of the chain stores generic brands. Hence, the results of this survey were pertinent to the present study but they were only descriptive. The marketing orientation of the study also limited the applicability of the results for Manufacturing. Refer Appendix 1 for results of this research.

1.2.2 Customer service survey

Early in 1994, the newly established Bowater Industries Australia, (BIA) Corporate national customer service department conducted a survey of salary employees, as well as direct retail and commercial customers of the BIA divisions, Bowater Tissue (Tissue), Bowater Deeko (Deeko), and Sancella. The survey, based on the Servqual concept, (Ziethaml, Parasuraman and Berry, 1990) set out to establish the importance, effectiveness and hence the gap between them, of a number of perceived key Customer Service items, one objective being to arrive at an "Overall Customer Service" rating. These key items were:-

> Delivery performance.
> Order entry process
> Stock availability
> Product line and features
> Sales representation
> Product condition on delivery
> Accuracy of invoices
> General administrative support
> Custom printing
> Overall communications

The survey, (called the BIA customer service survey), established the need for a change in the culture of the organisation, corporate and divisional, to improve service to its customers, and to establish priorities for corporate customer service. It determined deficiencies in a number of areas within the corporation, but because it was a corporate study, it was general rather than specific to napkin quality. The only specific area to be tested in the surveys as part of this research was that of delivery time, from receipt of order to delivery of the product to the customer. This was done

to determine if the different customer base and product ranges resulted in a different delivery time requirement for Deeko, compared with the traditional delivery time of 48 hours as decided by BIA management.

All products at Deeko had been allocated into "A", "B", "C" or "D" category products, using an arithmetic calculation based on sales dollar volume (turnover), gross profit (G.P.) and/or the presence of contractual obligations. For example, a product with high sales dollar and low G.P, could be equally rated an "A" product, as a product with low volume, but high G.P. Contract products were automatically classified as "A" products. The objective was that stocks of "A" products were maintained at all times in all states' distribution centres, manufacturing preference being given to these if required. "C" or "D" class products, with low volume or G.P., were those made to complement or complete a product range. Often these products were "make to order" products, in lieu of "make to stock". This research set out to confirm or reject the delivery time requirements dictated by BIA, so that meaningful delivery targets could be set for Deeko.

1.2.3 Product quality survey

In a survey conducted in 1993, to determine if there was commonality in the perceptions of quality between internal and two types of external customers, (Wallace, 1993, p 8.), significant differences between the three groups were found, which agreed with Bishop's (1990) findings when assessing survey responses. Internal customers, downstream customers in a TQM concept, were more critical of the technical aspects of quality, while the external customers were more critical of the functionality of the products. Research had sought a commonality of views which would enable internal surveys to be carried out, providing rapid and focussed information from which company strategies could be developed. The survey results demonstrated that alternative methods would have to be developed in order to establish relevant quality standards for manufacturing, relative to the external customer.

The surveys detailed above were intended to identify the end user customers' product requirements with respect to customer service and quality. However there are other aspects within a company which can adversely affect the ability to meet those requirements when they become known. These are discussed in Section 2, Manufacturing , Marketing and Logistics problems affecting quality.

2 MANUFACTURING, MARKETING AND LOGISTIC PROBLEMS AFFECTING QUALITY

Even though research may be conducted to determine a customers' requirements for a product, other problems exist which can hinder quality and customer service standards. For example, as part of the 1993 review of the company, two studies were conducted, specifically orientated towards napkins. These were an analysis of the complexity of the product range and the logistic channel length and complexity. These are discussed in this section.

2.1 Product Complexity

The napkin product group comprised over 50% of sales turnover at Deeko. This group in turn comprised 19 subgroups, or different types of napkins, being combinations of:

> - the number of raw material tissue plies which made up the major
> cost component.

> - the size of the napkin, typically classified by end use, Cocktail,
> Luncheon and Dining sizes.

> - the type of napkin folds made during the manufacturing process,
> specific folds being for particular applications.

Refer Fig. 2.1 and Appendix 2.

Fig. 2.1 Product Group Napkins Matrix.

Fig. 2.1 Product Group Napkins Matrix.
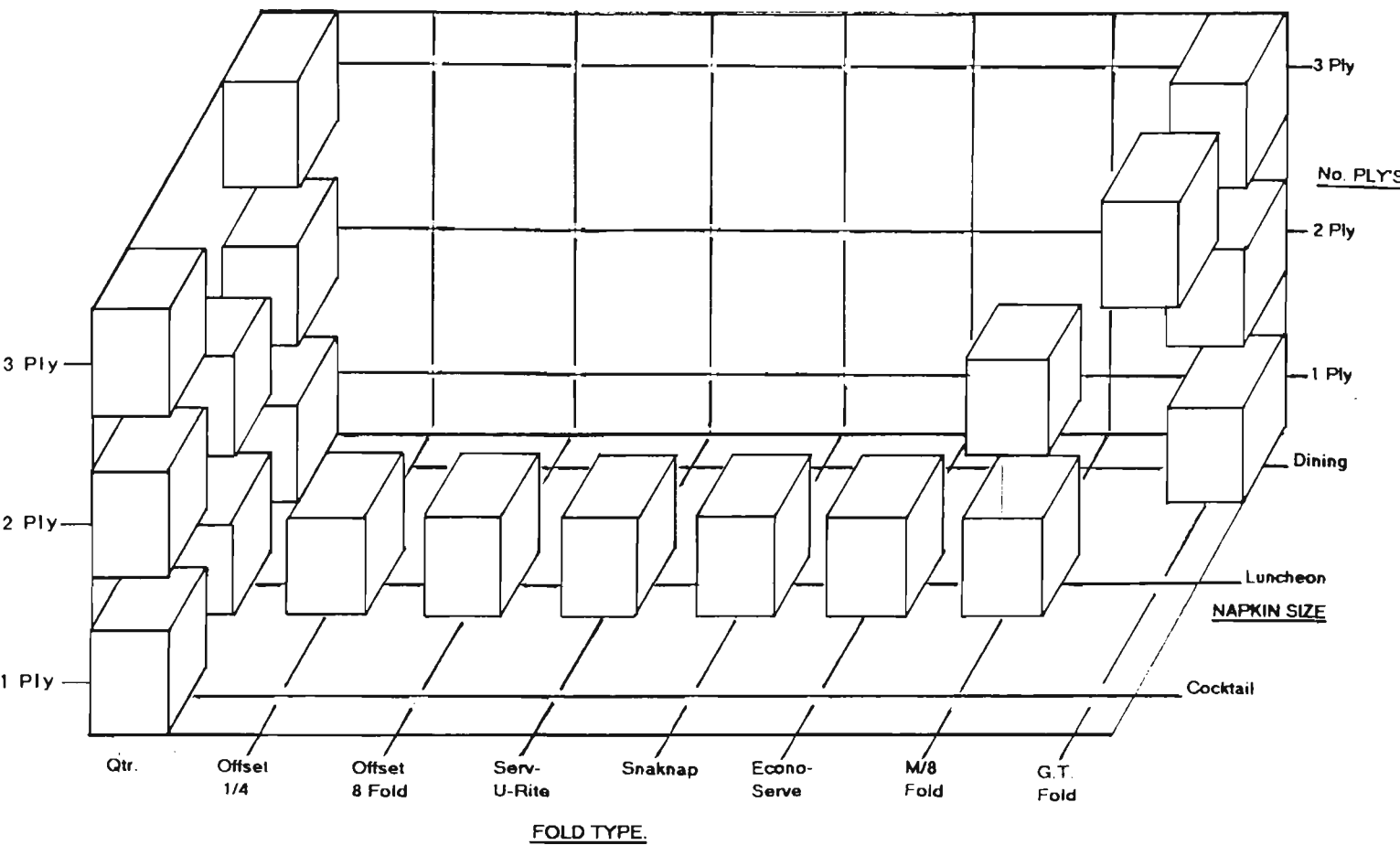
The machines involved in manufacturing these napkins were usually designed around a particular size of napkin, i.e. individual machines for Cocktail, Luncheon and Dining sizes. Often, the same machine was used for manufacturing different quality level napkins, based on the number of plies (1 ply versus 2 ply etc.) which involved a machine changeover, perhaps an emboss roll change to a different pattern, but a simple change to the reel of paper to be run through the machine. Within a short period of time, the same machine crew could be manufacturing a totally different napkin, pitched at a different market and price point. This change in product could demand a different quality requirement to achieve the budgeted manufacturing cost.

Without well established and precise manufacturing standards, clearly understood and applied by shop floor employees, costs through waste (and lost machine capacity as a result), would adversely affect the companies' profitability.

2.2 Logistic Channel Length and Complexity

The logistic channel length and complexity at Deeko was reviewed and found to reflect the diversity of the customers. The logistic channel design generally followed the same pattern across the food service industry, dictated by the concentration of chain stores as intermediate customers on the one hand and the small but geographically wide spread distributors on the other, refer Fig. 2.2.

Fig. 2.2 Logistics Channels.

CHAIN STORES	CASH & CARRY STORES	CONTRACT BUSINESS	RESTAURANT & CATERING	GOVERNMENTAL BUSINESS
IMPORTS / SUPPLIES	IMPORTS / SUPPLIES	IMPORTS / SUPPLIES	IMPORTS / SUPPLIES	IMPORTS / SUPPLIES
MANUF 'G NATIONAL DISTRIB'N CENTRE STATE DISTRIB 'N CENTRES	MANUF 'G NATIONAL DISTRIB'N CENTRE STATE DISTRIB 'N CENTRES	MANUF 'G NATIONAL DISTRIB'N CENTRE STATE DISTRIB 'N CENTRES	MANUF 'G NATIONAL DISTRIB'N CENTRE	MANUF 'G NATIONAL DISTRIB'N CENTRE STATE DISTRIB 'N CENTRES
30% CHAIN STORE DISTRIB 'N CENTRES	90% W'SALER W'HOUSE/ DISTRIB'N CENTRES	100% FAST FOOD CHAINS DISTRIB'N CENTRES	40% INDEPENDENT DISTRIBUTORS	
10% CHAIN STORES	10% CASH & CARRY STORES	FAST FOOD STORES	60% RESTAURANTS & TAKE-AWAY STORES	100% SEMI-GOV'T & GOVERNMENT
60%				
CONSUMERS	CONSUMERS	CONSUMERS	CONSUMERS	CONSUMERS

Note: Percentages indicate extent of "listening to the Customer"

National Distribution Centre located in Victoria.
State Distribution centres: Victoria.
New South Wales
Queensland.
South Australia.
Western Australia.

To better understand the logistic channel design and function, an analysis of the relationship between the various groups and Deeko was conducted.

Restaurant and catering channel

There were 142 distributors representing Deeko nationally, in the catering and food service industry. Many were independent distributors, small business units, often partnerships or sole traders, with little capital and operating in a specific region or market. Whether they understood their customers was doubtful and their perception of Deeko, as part of BIA, was of big business, imposing selective discounts, credit limits and trading terms. In such a highly competitive market, with other paper converters in the market place, there was little buyer-seller loyalty. The relationship therefore, although improving over time, was seen to be somewhat adversarial. This had increased with the BIA takeover of Deeko in 1992 and the recent recession, with tighter credit limits and stringent stop credit rules. The largest proportion of sales in this channel were made by groups of distributors with affiliations based on other products or segments of the food service industry. These groups, comprised many small store-front locations which fragmented information flow, upstream or downstream.

Contract business channel

Most of the contract business was with large companies, many with international affiliations. The customers often purchased using their own specification, Deeko matching a standard product to the specification. Often the only differentiation was the paper type (recycled versus virgin pulp), the number of tissue plies, or the design printed on the napkin. Deeko competed against other suppliers for these contracts and tried to build a relationship based on a unique product, service or price to preclude other suppliers in what was a high volume market. The customers in this channel included fast food restaurants, take-away food stores or chains and airlines. The Government business channel was similar to this channel.

Chain stores channel

Deeko's relationship to the chain stores was more of a partnership than other businesses in other channels. Due to better communication and interaction, the common sales force was able to take advantage of the synergy between the respective marketing groups within BIA. This channel was an important one, due to the high

volume and buying power of the chain stores. Deeko, because of its size could more easily afford the line fees required to get products on the supermarket shelves than competitors and thus had a greater market exposure and penetration. In addition, subscription to, and the use of the 'SAMI' retail sales analysis system, allowed Deeko to develop products and strategies based on the ultimate consumers selection, which was of benefit to the chain stores, giving them a better sales dollar to floor space ratio. This marketing strategy, based on knowledge and information flow, inhibited other suppliers.

Cash & carry channel

The information gathered in the chain store channel was applied to this channel. The business was similar and although the volume small compared to the chain stores channel, was growing. The approach to the relationship with the cash and carry stores was similar to the chain stores.

3 LITERATURE REVIEW

3.1 Introduction

This section reviews the literature available on quality and customer service from a historical perspective and the changes that have occurred over time. The various concepts of quality and customer service and their applicability to a paper converting manufacturing company are reviewed.

3.1.1 Background

The available literature on the development of quality and customer service in manufacturing was reviewed.

The major thrust for manufacturing in the early days of mass production was to maximise throughput and minimise cost. This was one of the motivators of Henry Ford when building the T model Ford. He believed the customer would always buy the cheapest product, while General Motors pursued a corporate strategy of market segmentation and differentiation. Ford ignored the customers' desires and maintained an attitude of "You can have any colour as long as its' black" (Ohmae 1983, p193-4), which ultimately almost bankrupted Ford Motor Co.(Sloan 1972, p 187).

The work of Sloan and others preceded that of Taiichi Ohno of Toyota (Sugimori, Kusunoki, Cho, Uchikawa, 1982) and W. Deming (1986), who were instrumental in developing concepts of focusing on the needs and desires of the customer. "Standardisation as a means of reducing cost and increasing production (increasing profitability), of a product has changed to giving service in line with changing customer expectations", (Deming 1986). This was made more clear by Cravens et.al. (1988) who stated:

" superior product quality is one of the most important strategic priorities facing business today. A company that focuses on their (sic) customer (sic) and satisfies them, will build a loyalty that will preclude competitors."

3.1.2 Customers Needs Difficult to Determine

One technique employed by companies in attempting to understand a customer's requirements in both service and manufacturing was consumer research. Such research was not always successful as Albrecht (1992a, p.111) pointed out:

> "...much of what passes for *qualitative* consumer research is little more than testing hypotheses about product characteristics. The limitation of this form of research is that it begins with an answer - the already defined product or service - and then asks the questions....they (the researchers) get no information on what the customers would like to see in the package.... if you've got a product or service that has not been designed according to a valid customer preference in the first place, all the positioning studies in the world won't help to get you into the customers' pocket or purse."

3.1.3 Applicability to Manufacturing

Early research into customer service in the manufacturing industry lagged behind the service industries which were much more closely allied with the end user. "Little scholarly attention has been given to the implications of service orientations to manufacturing firms." (Bowen, Siehl and Schneider, 1989, p.78). "In contrast to the literature on business and corporate strategy, that on manufacturing strategy is sparse." (Platts and Gregory, 1990, pp 10). The initial concentration of research into customer service as a corporate strategy was biased towards service industry companies because of their closer contact with the general public and sensitivity to early changes of consumer preferences. However, the continual quest to more effectively manufacture and supply goods and services to supply a cheaper and/or better product produced an increasing awareness of "the strategic importance of quality" (Sohal, Ramsey and Samson, 1991, p86.)

3.1.4 Linking of Quality and Customer Service

When manufacturers focussed on their customer and produced quality products which met their customers' requirements, they found that this was not enough. There were longitudinal aspects to be considered. Coulson-Thomas, (1991) made his views on meeting a customers' requirements clear:

> "However, quality by itself is no longer enough. Customer requirements are changing as customers become more demanding. If quality is assumed,

customer attention may switch to tailoring to particular circumstances. Softer requirements such as look or feel may emerge. It is being recognised that, as feelings influence purchase decisions and working preferences, there is value in the ability to identify, understand and relate to feelings."

Blakemore (1991) did not clearly spell out the need for customer service, but rather incorporated it in the overall definition of quality as: "always meaning uniformity, dependability, reliability at low cost, satisfying customers needs - within specification and with minimum variation - it means 'customer satisfaction must be No. 1'"

3.1.5 Summary of findings

It was clear from the literature that there had been a change in orientation by some manufacturers and that their definition of quality had widened from only physical quality to encompass customer service, as defined by the customer. Furthermore, quality was for ever changing, as customers' requirements changed.

Recognising there had been a change in focus of quality and customer service, literature on ways in which a manufacturing organisation in a mature market could improve its performance was reviewed.

3.2 Strategic Choice Options and Differentiation

The literature reviewed orientated towards the *service* industry stated that for a company to remain competitive and profitable, customer service must be paramount, be service or process specific and with tangible outcomes (Ziethaml, et al., 1990). The literature orientated to the *manufacturing* industry maintained that quality and customer service was important, agreeing they were strategic choices and an ongoing process (Bowen et. al. 1989; Bailey, Dunn 1991; Robbins, Barnwell 1989). All of the latter stressed that a manufacturing company must have an ongoing coordinated quality and customer service strategy from marketing through manufacturing to succeed.

But how important to a manufacturer should be the concept of customer service? And what form should it take?

3.2.1 Strategic Choices

Building on previous work by Skinner (1978) and Hayes and Wheelwright (1979), Platts and Gregory (1990), developed a useful definition of a manufacturing strategy as:

> "....manufacturing is a functional level strategy (as distinct from a corporate strategy and business strategy) ....manufacturing strategy is viewed as a competitive weapon for the achievement of business and corporate goals", ie the method of implementation of corporate and business goals.

Bowen et al (1989, p.80) did not identify a manufacturing strategy this way. Rather they saw the two strategic choices for manufacturing firms as either:

- a strategy that emphasises customer responsiveness, high customer contact and the resulting marketing and sales opportunities.

- standardisation and low customer contact with the resulting operating efficiency.

They detailed the four dimensions of a manufacturing strategy as:-

(a) cost;

(b) quality, in the form of superior products;

(c) dependability of supply in the form of high availability of product;

(d) flexibility in the form of a willingness to offer various product variations.

Krajewski and Ritzman (1993, pp 47) listed eight dimensions based on the work of Skinner (1978) and Hayes and Wheelwright (1979), which fell into four competitive priorities. They indicated the features that a firm's production system must possess to support the demands of the market the company wishes to compete in. These were the same as Bowen et al.(1989) but more specific;

Cost

1   Low cost.

Quality.

2   High performance design

3   Consistent quality.

Time

    4   Fast delivery time.

    5   On time delivery.

    6   Development speed.

Flexibility

    7   Customisation.

    8   Volume flexibility.

Slack (1991) and Krajewski et al (1993) more or less agreed, listing the five performance objectives of a manufacturing strategy as being:

Quality

Speed

Dependability

Flexibility

Cost

Slack stated the success of a manufacturing strategy for a company depended on the combination of objectives and relative emphasis placed on each. Krajewski said that, at some point, improvements in one dimension are accompanied by set backs in other dimensions and that managers must recognise the trade-offs that must be made.

Bowen (1989) put it more strongly;

"........within a given industry, companies emphasise each of these dimensions to varying degrees, but it is difficult, impossible, or dangerous for a company to try to compete by offering superior performance along all dimensions simultaneously; trade-offs must be made.......an increased likelihood that this choice will be resolved to include service orientated goals are that differentiation can be a successful strategy in certain conditions, *for example in mature product markets.* "(author italics)

An example where mixing strategies was dangerous is given by Lewis, (1993, pp713), when Ford Motor Company changed a product range:

"Henry Ford's mass-production method had three elements. The first was standardised product design, which allowed specialised technology and routine work methods. A 1917 observer noted what happened when the Ford engineers changed the appearance of the hood and fenders: 'The first month saw production curtailed by 50% and it was nearly three months before the entire organisation could be geared up for the stipulated work.'"

If Ford had pursued a strategy of differentiation, he would have lost the competitive advantage he held over General Motors *at that time*. As discussed previously, it was the inability to recognise the need to change strategies which reduced sales and ultimately drove Ford into being more responsive to customers.

There was general agreement on the forms and dimensions of strategies for a manufacturing company and the recognition that trade offs had to be made if a specific strategy was to be successful. Another strategy however, was one of differentiation.

3.2.2 Differentiation

While Platts (1990), Krajewski (1993) and Slack (1994) all identified the strategies and discussed the trade-offs, only Bowen et. al. (1989, p. 78), differentiated between the technical aspects of customer service, (were things done correctly?), and the relationship aspect (was the customer treated properly?). This was substantiated by research conducted at Deeko in 1993 (Wallace, 1993, p 8.), where a survey found significant differences in the responses between the three groups surveyed. Internal customers were more critical of the technical aspects of quality, while the external customers were more critical of the functionality of the products.

While differentiating between the service and manufacturing industries, Bowen et al.(1989, p 77) pointed out that each industry could use features from the other with regard to customer service. They identified the "prototypic characteristics of manufacturing production and delivery", and the "prototypic characteristics of service production and delivery", going on to list the service orientations in manufacturing firms versus the manufacturing orientations in service firms which they believed should be implemented. (Refer Appendix 3). These included incorporating service orientated goals in a firm's strategy and adopting service organisation arrangements (where appropriate). These customer service orientated activities, called "augmented products", fell into three categories:

- design related activities that enhance reliability (quality) of the product,
- strategies that focus on response times to customers requiring service or assistance,
- service strategies which include delivery, installation, service, credits, warranty and after sales repairs.

These "augmented products" provided a potential source of product differentiation, important in a mature market for a manufacturing firm. The six strategies of differentiation detailed by Mintzberg and Quinn, (1992, pp75), when distinguishing the core business of a company, were similar to the augmented products of Bowen et. al.:

Price differentiation strategy

Image differentiation strategy

Support differentiation strategy (delivery or service)

Quality differentiation strategy

Design differentiation strategy

Undifferentiation strategy

Martin, Payne and Ballantyne (1991, pp. 60 - 61) also discussed the benefits of a differentiation strategy and the four levels of "offers" to a customer. These were:

- Core or generic - the basic component or product.

- Expected - a customers' minimum requirements when purchasing a product, e.g. an instruction manual for a video recorder, etc.

- Augmented - seller's features over and above what the customer expected or is accustomed to.

- Potential - potential added features which add value to some customers, "locking in" existing customers and attracting new ones. (And by inference, "locking out" competitors.)

The sum of the levels thus created the total product concept.

While strategy was seen to be vital in establishing the specific environment and the operating domain of a company, that alone did not appear to set out a mechanism for quality and customer service; it was rather more like scene setting. Other mechanisms were investigated to assess customer service performance.

3.3 Assessing Customer Service Performance

3.3.1 Order Winning /Order Qualifying Criteria

To determine which quality and customer service aspects satisfied customers' requirements in a manufacturing strategy, Hill (1989) developed the concept of order winning and order qualifying criteria for products to determine the most appropriate strategy for a product or group of products, *once the corporate objectives and marketing strategies had been defined.* (authors italics) Criteria typically included price, quality, delivery speed and reliability. Order qualifiers were those product features which were necessary for a product to be considered by customers in the

market place. Order winners were those criteria which would help to win business from competitors, while order losers were criteria, a lack of which would cause the loss of an order, e.g. products which failed to complement others within a product group range. Hill maintained that the development of a manufacturing strategy using the order winning / order qualifying method allowed new approaches to investment, plant size and investment decisions to achieve quality and customer service. Certainly, as a disciplined approach to the development of a manufacturing strategy, the order winning process was a useful tool, *once the criteria a customer expected was known for each product or range of products.* But in the process of satisfying a customer, it was the determination of this criteria which the present research had set out to do. Hills' order winning/order qualifying criteria was therefore considered to be later in the sequence of developing a strategy from the objectives of this research. Many of the order winning criteria listed by Hill were also those identified by Mintzberg (1992), Slack(1994), Bowen (1989) and Krajewski (1993).

3.3.2 Gap Analysis

One method of determining a company's performance was to survey customers and compare responses on expectations and perceptions by respondents to the companies' performance, the difference between them being the "service gap". This process identified items where deficiencies existed and allowed priorities to be established for improvement, by reducing the largest gaps. Another benefit was its capability of being used in longitudinal studies, giving visibility to changing customer attitudes and requirements. A number of systems were developed using this principle.

One such service gap model was developed by Apte, Karmarker and Pidblado (AKP) and used in identifying service gaps for the TAG group of companies (Apte, Martin, 1994). This system comprised two parts, (a) designing quality service and (b), delivering quality service. The first part required management to design a quality service model, taking into account a customer's expectations and competitor's service specifications. The second part not only had requirements for employee training, but also for communication with customers. While conceptionally sound, this model was considered to be too complex in application, although reportedly successful for TAG, a gas pipeline and gas supply company.

Ziethaml, Parasuraman and Berry (1990), developed the "Servqual" customer survey, to determine gaps between the service offered and perceived by a customer in the service industry. This process had the benefit of being relatively simple in design and able to directly compare respondents' expectations and perceptions. It was found that end users had difficulty in using this model to measure their perceptions of quality on manufactured products. Using the Servqual gap model was seen to be advantageous, and is discussed further in Section 5.5, Questionnaire design.

3.4 Linking Gap Analysis and Manufacturing Strategy

Slack listed four steps in the development of a manufacturing strategy using gap analysis (referred by Slack as gap methodology):

> "- Develop a specific idea of what should be important to the manufacturing function in order to compete effectively, answering the question of what its objectives should be.
>
> - Assess the actual achieved performance of the manufacturing function.
>
> - The gap between what is important and what it is achieving drives the priorities for performance improvement.
>
> - The performance priorities govern choice and implementation of long and short term improvement plans." (Slack, 1991, pp186).

Slack then used the order winning / order qualifying process of rating the manufacturing objectives in order to ensure that they met the customers priorities, going on to develop an improvement / performance matrix which would illustrate a product's priorities on the matrix, refer Fig. 3.1. Slack stressed the dynamic nature of the matrix due to changing customer preference and competitor activities.

Fig. 3.1 Importance / Performance Matrix

(Slack, 1994)
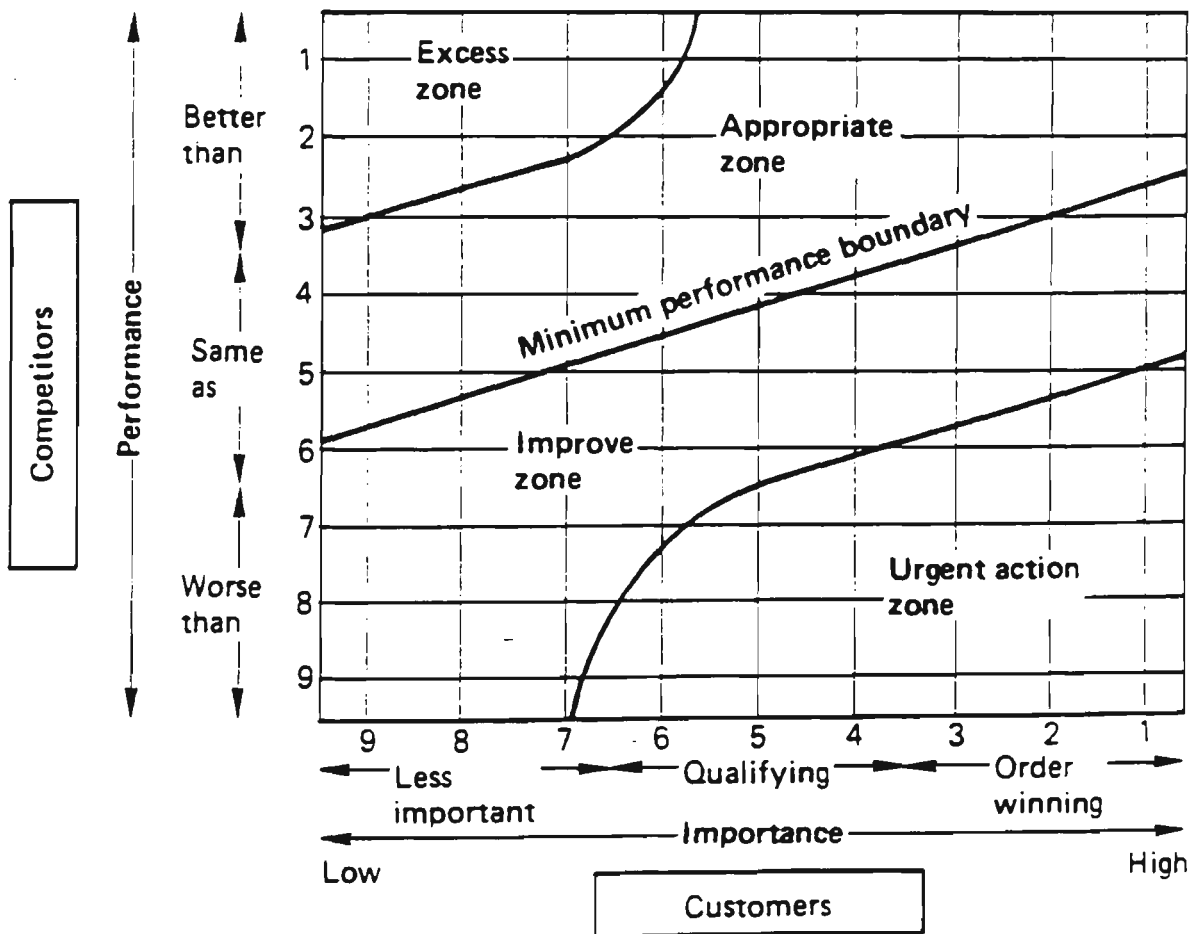
The importance/performance matrix compares what customers find important in achieved performance when compared with competitors

The Slack model appeared better than the Servqual one because as well as being suitable for longitudinal studies, it introduced the concept of benchmarking against competitors.

But difficulty was experienced with Slacks' first of four steps;

> "Develop a specific idea of what should be important to the manufacturing function in order to compete effectively, answering the question of what its objectives should be".

Where did the customers' views fit in? Certainly in a longitudinal study, customer feedback would assert itself, but given that this research was the first of its type being conducted in a paper converting company, it seemed inappropriate to make initial assumptions. It was decided that Slacks approach was unsuited for this research as it lacked initial consideration of customers views. Xerox took a totally different approach to customer service, which follows.

3.5 Human Behavioural Approach

A different approach to quality and customer service was that taken by Xerox, which rejected the usual quality and statistical concepts, approaching it in human behavioural terms of its employees (Caudron 1991, p.98). Extensive internal training programs were developed, training employees in solving problems, improving quality and customer satisfaction, at a cost of US$125 million and over 4 million man hours. Market leadership was regained by Xerox as a result of these activities but, in *only* reducing customer complaints by 60% and increasing customer satisfaction by 40%, this would not have appeared to justify the time and expense. The increased sales as a result of being recognised as the market leader and winning the Baldridge award however, were not quantified. In the writer's view, the fact that there remained a further 40% of customer complaints to resolve, cast doubts on the effectiveness of this approach. This option was not considered applicable to this research as its thrust was from a different perspective.

3.6 Links With Product Life Cycle

From Hayes and Wheelwright (1979), Nahmais (1989, pp 27-31) identified the four basic elements of a production and operations strategy as (1) time horizon, (2) focus, (3) evaluation, and (4) consistency, with the means of evaluating the effectiveness of a particular business as cost, profitability and quality. Based on Nahmais' definition, paper converting was seen to be a mature industry:

> ..."in the maturation phase of the product life cycle, the objective should be to maintain and improve the brand loyalty that the firm cultivated in the growth phase. Management should seek to increase market share through competitive pricing. Cost savings should be realised through improved production control and product distribution. During this phase the firm must listen to the marketplace. Most problems with product design and quality should have been corrected during the start-up and growth phases, but additional improvements should also be considered during this phase."

It was considered relevant to assess Deeko's position on the product - process matrix from Hayes and Wheelwright (1979) and its affect on quality, because this matrix illustrated the stages through which a company progressed in the life cycle of a product.

" the third category down the diagonal includes firms that produce a line of standard products for a high volume market."

Deeko was considered to be in that third phase in Fig. 3.2., because it had a tendency towards the high volume, high standardisation, commodity products and a semi-automatic batch process manufacturing operation.

Fig. 3.2 The Product - Process Matrix

Process structure Process life-cycle stage	I Low volume, low standardization, one of a kind	II Multiple products, low volume	III Few major products, higher volume	IV High volume, high standardization, commodity products
I Jumbled flow (job shop)	Commercial printer			Void
II Disconnected line flow (batch)		Heavy equipment		
III Connected line flow (assembly line)			Auto assembly	
IV Continuous flow	Void			Sugar refinery

While considered important, in fact Nahmais said little more on quality in this context, although the requirement to ensure the product satisfied a customers' requirements before large capital investments were made, meant that customer feedback was important. One item determined from this book was the importance of strategic choice in determining quality in manufacturing industry.

The conclusions drawn therefore were that for a mature market, strategies which offered differentiation from competitors were more likely to succeed. The choice of a quality and customer service strategy however depended on feedback from the customer or user, both intermediary (distributor, wholesaler and retailer) and the end user(consumer).

3.7 Types of Feedback

All the literature reviewed stressed that a strategy to provide feedback, whether to a service or manufacturing industry, was crucial in determining the needs of a customer, but differed on the form(s) it should take. Albrecht, (1992 a, p. 124.) advocated that a customer score card be developed in order to survey customers indirectly. On the other hand, Bailey and Dunn (1991) advocated the use of telephone surveys, mail surveys, face-to-face interviews, complaint analysis, lost account surveys and focus groups. Band (1990), in addition to these methods, also suggested periodic focus groups. Provided they were ongoing to give a longitudinal picture to identify changing customers perceptions, one or more of them could be valid means of obtaining feedback. The current research also had the ability to be extended in the future to give a longitudinal picture.

3.8 Conclusion

It was concluded from the literature that the understanding of quality had changed over time and now included customer service. In addition, it was recognised that customers' perceptions of quality and customer service were a constantly moving target. The only way in which a company could ensure they constantly satisfied their customers was to obtain feedback from them. However there were strategic implications involved in establishing a process of satisfying a customer, which if mishandled, would have a detrimental effect, not only on customer service , but on the long term profitability of the company.

While many options for a company's research were reviewed, none appeared to present solutions to resolving the problem of how a company in a mature market with diverse product range and a wide domain, could achieve quality and customer service when that same diverse range and domain presented conflicting strategic choices and had separate differentiation requirements.

The available knowledge supported the concept that companies such as Bowater Deeko needed to determine what quality and service meant to each group of customers.

Based on the literature review and prior research at Deeko, a theoretical construct was developed and extended to include the relational and technical aspects of customer service (Bowen et. al.., 1989). This is shown in Fig. 3.3 below and explained in Section 4, Hypothesis.

Fig.3.3 Theoretical Construct of Problem

Statements.

$$Quality \neq Service$$

$$(N1)Q1 \neq (N2)Q2 \neq (Nn)QN$$

$$(N1)S1 \neq (N2)S2 \neq (Nn)SN$$
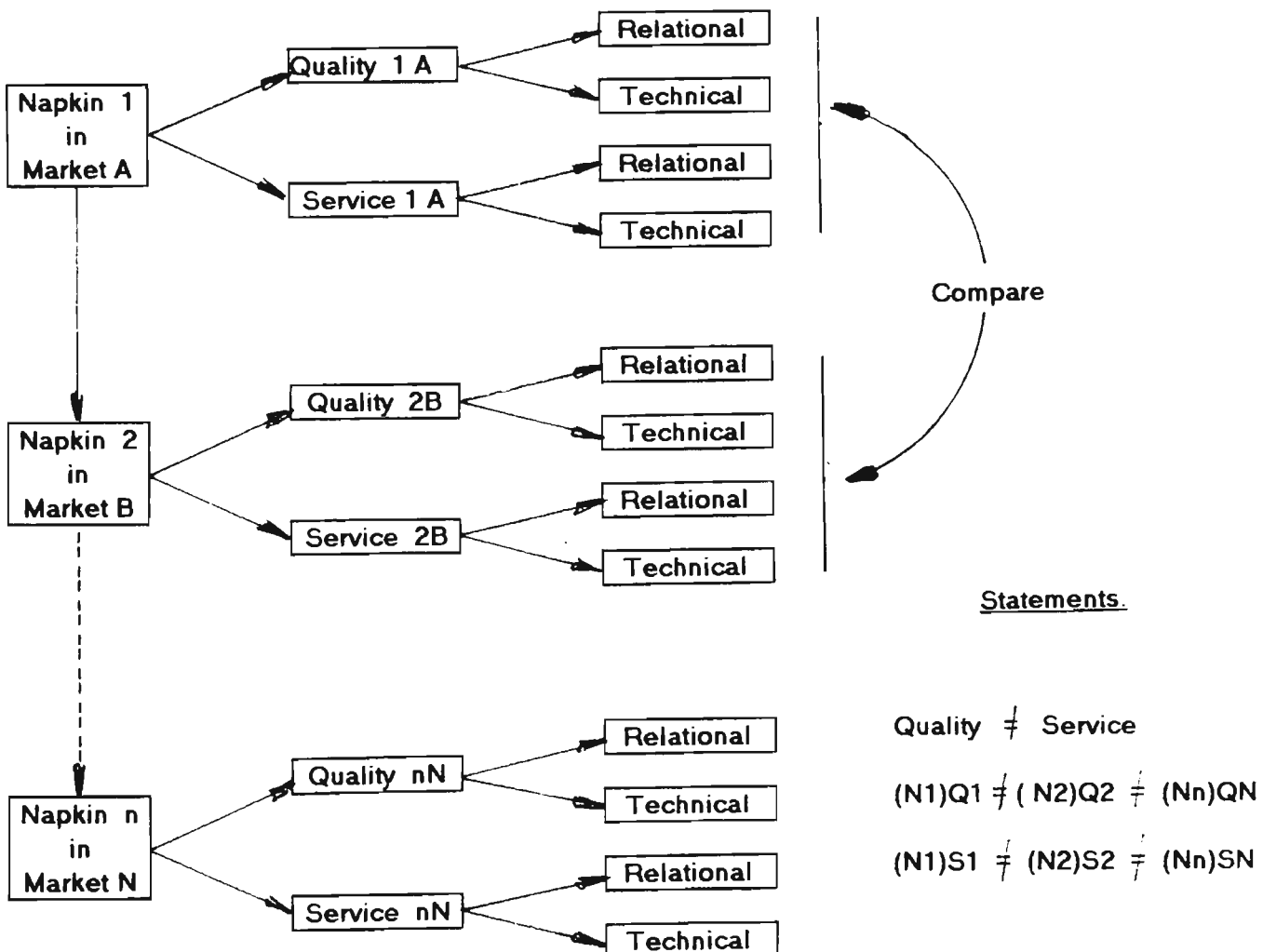
4. HYPOTHESIS.

The review of the available literature found there had been a change in orientation of quality and service by manufacturers over time and that the definition of quality had been widened to include customer service. Strategies for differentiation in a mature market based on customer feedback were identified and the types of feedback discussed. While customer feedback was seen to be important, the effect of quality and customer service with respect to different product groups within a manufacturing environment had not been identified in previous studies.

Limited prior research had shown that for products in a mature market, there were two components to both quality and service, relational and technical, and that in a mature market, the relational aspects of customer service assumed a greater importance than the technical.(Bowen et. al. 1989, p. 87)

A hypothesis was developed that:

"Over a range of different napkin product groups, quality and service mean different things to different customers."

The means of substantiating this hypothesis was by testing the following sub-hypotheses:

1. That customers purchasing napkins from different product groups expect different levels of quality.

2. That customers purchasing different product groups have different service requirements.

3. It is possible to measure the order winning criteria for groups of customers in order to provide strategic direction to one paper converting company.

If these sub-hypotheses addressing quality, customer service and order winning criteria were proven, their evidence would logically substantiate the overall hypothesis.

The choice of appropriate research methods and how these hypotheses were tested is detailed in Section 5, Methodology and Research Design.

5 METHODOLOGY AND RESEARCH DESIGN

5.1 Methodology Choice

This section explains why the hypothetico-deductive methodology was appropriate to substantiate the hypotheses. It also explains the choice of method, the pilot studies used to test it, the design of the instrument, and the product and subject selection.

A number of factors were considered in the selection of method of conducting the research. As specific outcomes were required by the company as part of the results of this research, a descriptive study had to be rejected. The definition of the problem precluded the use of control groups, simulation and a laboratory experiment. Internal validity, although of importance to the company, was considered to be less important than generalizability, (Sekaren, 1992, pp 13). The range and type of data being sought resulted in the research being both qualitative and quantitative, (refer section 5.6) with the customer type influencing the quality and service required. In addition, as there had been well documented prior research, the use of deductive methodology building on prior research (Wallace, 1993; Consensus Research, 1991; BIA, 1994), would enable the hypothesis to be tested adequately.

5.2 Method of Conducting Research

The method of conducting this research included:

- conducting a cross-sectional causal field experiment using two instruments with common core sections, supplemented with a series of structured interviews with representatives of the surveyed groups, to obtain a series of responses on specific items related to quality and customer service, (refer section 5.8).

- correlating the results from the surveys above with information gained from the marketing brand survey.

- extracting relevant data from the customer service surveys conducted by BIA of employees and customers. Concerns existed regarding these surveys in that they were not sufficiently focussed, averaging results of the population responses and as a result, too general to be useful to this research.

Although the concepts of the theoretical construct were interlinked an heirachy was established. It was considered that product selection was the most important, followed by the subject choice and the data collection technique, in that order.

5.3 Product Selection

5.3.1 End user Product Selection

The products to be used in the surveys were selected using the following criteria:
- to select products from as wide apart in market terms and price points as possible, for maximum differentiation of customer expectations.
- to select products which represented large segments of the business in dollar turnover rather than quantity of cartons sold, to maximise relevance to the business, even though the same product type may be sold in different markets, in varying quantities per pack to suit that market, e.g. catering versus retail.

Based on the above, the following products were selected for the end user surveys:-
a) A high series, 3 ply 1/4 fold dinner size napkin, sold at a price premium.
b) A low series, single ply 1/4 fold luncheon size napkin usually defined as a 'price fighter'.

These products comprised 45% of the napkin product group sales turnover and were the two largest individual segments. While they were targeted toward different market segments, they were both part of the quarter-fold subgroup which totalled 73% of the napkin market.

5.3.2 Intermediary User Product Selection

It was decided to use the product sold to each company for the intermediary user survey. Each respondent would be asked to respond to the same questions put to the end users. As every intermediary user specified 1 ply napkins, these could be compared directly to the end user "price fighter" brand.

5.3.3 Implications of Product Selection

Direct comparison of the two single ply napkins meant that results of the research could be extrapolated to other single ply napkins in other product groups. In addition to this, as the manufacturing process for all napkin types included folding, responses regarding fold quality would have applicability to other napkin segments, even those with multiple folds.

5.4 Subject Selection

5.4.1 End Users.

Two population groups of end users were surveyed, one for each of the two napkin types, called the End User surveys. Each group was stratified into quota sample groups by age. This was done because napkins are used broadly by the national population and responses were wanted from all groups to prevent selection bias.

The brief given to Australian Total Quality Research (ATQR), who conducted the survey, was to obtain enough responses within the survey groups, to achieve a 95% confidence level. A minimum of 60 surveys, split between the two napkin types were obtained. As discussed in Sections. 5.4 and 5.5.3, demonstration products were to be used with each survey and interview.

5.4.2 Intermediary Users

An analysis of Deeko's catering division which comprised approximately 58% of total company sales, was conducted. Customers of the division, intermediary users, were categorised into two major groups then ranked in size by dollar sales by state and nationally. The first group, contract customers, comprised fast food stores, restaurant chains and airlines. Of this group, four customers comprised 18.3 % of the catering division sales. The second group comprised all 142 Deeko distributors throughout Australia. Analysis of this group found that seven distributors comprised 16.8 % of catering sales. However four of these top seven distributors comprised many regional, smaller agencies. Consequently, while the distributor group as a whole were the largest segment of the catering division, no single agency held more than 2.3% of the divisions' business.

The split of intermediary user by sales thus became:

Name	Ranking	% Sales within group.
McDonalds	1	9.5
Qantas	2	3.6
Distributor group 1	3	3.5
Hungry Jacks	4	3.0
Distributor group 2	5	2.9
Distributor #3	6	2.3
Ansett	7	2.2

It was decided to interview numbers 1,2,4,6 and 7 which represented approximately 20.6% of the sales of the catering division. Three companies declined to participate for various reasons. Obtaining responses from companies which represented 12.5% of catering sales was considered to be sufficiently representative of the total population, particularly as these companies, McDonalds, Hungry Jacks and Wendy's also had a large number of outlets. These totalled 905 nationally, giving a wide distribution of subjects. One smaller fast food group, Wendys, had been interviewed as part of one pilot program and were consequently included.

The geographical spread of the intermediary user responses was determined on the basis of sales by state. Responses were sought in order of size from the states as follows;

NSW	1	50%
Victoria	2	27%
Queensland	3	13%
South Australia	4	10%
Tas, WA, NT		None

5.5 Selection of Data Collection Technique

Given the products and the population groups, a number of options were considered for data collection. Previous research had been based on surveys of respondents located in the manufacturing premises. Interviews were then rejected due to the

psychological effect of employees being interviewed by management. This research had no such problem, but was faced with the geographical problem of wanting responses on a national basis from corporate customers, with end users from as broad sociological groupings as possible. Face to face interviews were not possible due to the cost of transport and accommodation and the time involved by the author in collecting data. For these reasons, it was decided that questionnaires again be used.

Ultimately the questionnaires were used in structured face to face interviews for end users with display samples for reference. Structured telephone interviews were also used for intermediary users. Permission was requested and obtained from the head offices of the fast food restaurants to survey selected store owners/managers in various states. To overcome the geographical problem, the survey was faxed to the respective store owners/managers for review, prior to them being contacted by phone and obtaining their responses, using Deeko supplied products as reference samples. This enabled the flexibility of interviews to be introduced into a questionnaire. The use of samples for display purposes during the interviews was deliberately done to improve precision and create as near to experimental conditions as possible. How the data was collected is covered in Section 6, Data Collection and Processing.

5.6 Questionnaire Design

This section discusses the various options in questionnaire design and the development of the final questionnaires.

The definition of the problem and development of the hypotheses required that data be gathered from a variety of sources. It was important for accuracy of data purposes that the statements be common, but also be unique in relevant areas. If the survey was to be kept to its simplest, then a questionnaire with irrelevant sections ("if yes to this question, go to section....") would have to be avoided. Two questionnaires were thus developed, with common core sections and unique sections to suit the intermediary users and end users. An important aspect of the design of the questionnaires was to be able to accurately achieve a ranking of importance of the various elements. The design of the questionnaire was important, not only to ensure that the answers received were relevant to the questions asked, but to prevent a "tick

the boxes in a line" syndrome. If this occurred, the first questions or statements could be answered logically, but subsequent statements lose their accuracy. Thus two problems had to be overcome by questionnaire design.

5.6.1 Ranking

One technique of determining ranking of importance of questionnaire topics investigated, was to use a questionnaire based on the measurement of the gap between a customers expectation of a particular element, compared to their assessment of the achievement of that expectation. The "difference" between the two, the gap, became a measure of success or failure in meeting the customers' expectation. The size of the gaps of various elements could then be compared to establish a ranking of importance for improvement. One version of this survey, known as the Servqual survey, (Ziethaml et al, 1990), was developed particularly for use in assessing service quality in service industries. An advantage of the Servqual survey was that its construction gave it relevance across a range of applications with relatively little modification. It also gave continuity in longitudinal surveys over long periods of time.

One section of the Servqual survey asked respondents to rank both the importance and effectiveness of a series of statements. A small pilot study in this research showed that while respondents could rank the importance of a particular element, some had difficulty in ranking the effectiveness of that element. Another section of the Servqual survey asked respondents to respond to a series of statements, ascribing a value to each, to a total of 100. This achieved the objective of forcing the respondent to address the importance to each and ranking them accordingly. While this method was thought to be not as good as the importance and effectiveness method, it was considered that with a questionnaire which required the allocation of a value, at least the first half of the statements could be ranked accurately, while the "tail" would be ranked by rounding off to achieve the total score. This was thought to be acceptable if five or more statements were to be ranked. Once a series of questions had been developed, a survey was constructed along the lines of the Servqual instrument.

5.6.2 Likert scales

Following the pilot studies, it was considered that for a questionnaire of this complexity, the use of the Servqual ranking technique in all sections could be difficult for respondents to complete, resulting in them "turning off" or not completing the questionnaire. Accordingly, this format was used sparingly, the next sections of the questionnaire being developed using Likert scales. A seven point scale was selected because of its openness, compared to the tighter five point scale. It was thought that this would allow some ranking by respondents, although not as tightly perhaps as the addition type questionnaire. The latter section comprised a series of statements which were not necessary to be ranked. Rather they were to determine whether the strategy of the company on a number of issues associated with quality and customer service was in line with customers expectations.

5.6.3 Interview style and content

During the development of the questionnaires and the conducting of the pilot studies, it was found that much information sought could not be condensed into a series of statements capable of being ranked or valued.

For example surveys had been done (Consensus Research, 1991) on understanding the consumer psychology in the market place in which the company operated. One of the issues established had been the difference between napkins manufactured from recycled and virgin tissue, the difference often being colour and texture. Technically, at the time of this research, it was not commercially viable to produce a fine paper napkin from recycled tissue, due to the change in fibre and variability in raw material affecting the cost of manufacture.

The selection of a recycled napkin therefore developed into a feel good or emotional issue for the consumer, which may have to overcome a cost penalty. Given any napkin, whether recycled or not, the decision of the consumer to select a napkin was considered to rest with their perception of colour or feel, both of which were affected by the grade of tissue used and ultimately the feed stock used in the paper mill.

Previously, tests had been carried out in house in attempts to quantify respondents attitudes to colour and texture. Colour, whether of the tissue or printing on the napkin was particularly difficult. The manufacturing process was conducted under conditions using standard fluorescent and natural lighting in a manufacturing environment. Quality checks were conducted using light boxes with standard quality lighting to ensure consistent colour matching. However, there were two problems with this method:

1. While napkins were manufactured in one lighting environment and checked against a standard, these conditions could bear no resemblance to the environment in which napkins were used, or seen by the consumer. In addition because of the general nature of the product, they were used in all environments. For example the same napkin could be used outdoors in both bright sunlight or clouded conditions, (which varies nationally), in a bistro with harsh fluorescent lighting, or a restaurant using candlelight. These variations in light greatly affected the colour as seen by the consumer.

2. The different manufacturing process of tissue and inks meant that the colours could be metameric. This phenomena was described by Varley, (1988, pp244) as follows:

"........Two surfaces or other light sources that look the same colour to a standard observer, but the light mixtures they send to the observer's eye have different wavelength compositions. If the illuminant is changed, a metameric pair will usually appear different colours. The most familiar example is a pair of fabrics that look the same under fluorescent store light, but do not match in daylight, because the compositions of the light reflected from the dyes in the two samples have shifted and now stimulate the eye in different ways."

How a consumer looked at a napkin therefore was important. Complex and extensive testing using laboratory equipment could be used but was outside the scope and abilities of this research. The object of this research was to try to understand more *how* a consumer looked at a napkin rather than quantifying *what* they saw, the theory of the technical aspect of quality versus than the functional aspect of quality. (Wallace, 1994 pp 4).

Because of this, it was decided to include in the surveys a number of verbal questions to allow a free response from the respondents, while using reference samples on display. The objective of these questions was to elicit more information and to better define the basis on which opinions of how colour of a napkin were perceived.

5.7 Pilot Studies

As discussed in Section 3.3.2, the initial format was based on the Servqual concept which had the ability to measure the gap between actual and expectation, as well as being able to quantify the ranking of various elements. A number of pilot studies were developed in sequence and modified as responses showed deficiencies. The first required two responses to each statement, the left hand response being the expectation of the respondent, the other, on the right side, the respondents' rating of performance in meeting that expectation. Difficulty was experienced, particularly with the end user survey, in developing statements which the respondent could rank performance, as in many cases there was confusion by the respondent as to how to rate the performance. In addition, the length of time taken in answering the statements during the pilot study and the perceived difficulty when confronted with the survey resulted in the respondents giving up as "too hard". A new pilot survey was therefore developed.

The second pilot study asked respondents to put a value against each statement, to a total of 100. The objective was to force the respondent to address the importance of each item and rank them, making the respondents think more about the issues. While a certain amount of rounding off of values took place for ease of addition, the successful completion of this pilot study resulted in this type being retained for specific statements.

By far the easiest type of questionnaire for respondents was found to be that using a likert scale, perhaps because of the familiarity many people had with this format. The use of negative statements scattered through the questionnaire showed some evidence of mechanical responses, or not understanding the statement but it was decided that some statements were most suited to this format, and included accordingly.

5.8 Summary of method adopted

Finally questionnaires were developed which combined all three elements, Servqual addition to a value, seven point Likert scale and interview structured questions.(Refer Appendices 4 & 5). The questionnaire layout became as follows:

Item	End User	Corporate	Comment
Background Information	5 Questions	3 Questions	
Ranking of Quality and Customer Service (Part common)	Section 6 5 Questions	Section 4 7 Questions	Servqual format - 3 common statements
Ranking of the Technical Aspects of Quality (Common)	Section 7 8 Questions	Section 5 8 Questions	Servqual format
Napkin Evaluation (Common)	Section 8 7 Questions	Section 6 7 Questions	7 Point Likert scale
Delivery performance	not included	Section 7 6 Questions	7 Point Likert scale
Interview Questions	6 Questions	7 Questions	Interviews
Interview Questions - Colour and Selection Criteria (Common)	2 Questions	2 Questions	5 Point Likert scale
Interview Question Delivery Time	not included	1 Question	

Final drafts of these surveys were used to assess the responses of some of the respondents tested using the pilot studies. When the results obtained from each were compared, the consistency of the information confirmed the test-retest reliability of the surveys.

Further revisions were made to form, structure, logic, grammar and style, and approval was obtained from a Victoria University of Technology ethics committee. How the surveys were completed is discussed in Section 6, Data Collection and Processing.

6 DATA COLLECTION AND PROCESSING

With the surveys finalised and University ethics committee approval obtained, the services of ATQR, a market research consultant, were commissioned by Deeko to conduct the survey on the researcher's behalf.

This section details how the data was collected, describes the techniques used in processing the data obtained from the surveys and how it was analysed.

6.1 Data collection

6.1.1 End User Surveys

ATQR had a number of trained interviewers who were skilled in conducting interviews with the general public. Approval by the management of the Westfield High Point West shopping centre complex was given to ATQR to conduct the surveys on their premises over a two week period during the Victorian school holidays. As discussed in Section 5.3.1, times of interviews were planned and interviewees selected and approached with the objective of obtaining responses from all population groups.

6.1.2 Intermediary User Surveys

Contact was made with each of the corporate head offices of the companies selected. In the case of the fast food restaurants and take-away stores, approval to interview specific store managers or franchisees, to obtain feedback from the level of management closer to the ultimate end user, was readily given. Contact to each store was then pursued by ATQR, who in the first instance telephoned the principal franchisee, using the Head Office approval as an introduction. Surveys were then faxed to the respondent, who either completed the survey and mailed it back, or responded to the survey in a subsequent telephone interview.

6.1.3 BIA Customer Service Survey

After the release of the results of the BIA customer service survey, the values of the key research findings of the importance, the effectiveness and the service gap between customer requirement and Deeko performance were tabulated. The average of the gaps for all 3 items were calculated, as was the average for the retail and commercial sections, the intermediary users. The results were ranked from the largest gap to the smallest and detailed in Appendix 6. A comparison was also made between the BIA intermediary user responses by service gap, to the 'Ranking of quality and customer service" section in the intermediary user survey which is described in Section 7.3.2.

6.1.4 Recording

The completed surveys were checked for completeness and accuracy using a master data coding sheet, (refer Appendix 7) before tabulation. As a concern regarding the ability of respondents to correctly add to 100 had been raised, (refer section 5.5.1, Ranking), the error rate was monitored. Of all the surveys, both end user and intermediary user, only sixteen sections or 2.1% were incorrectly added, statistically unimportant and considered acceptable.

Interview questions and word responses

As detailed in Sections 6.1 and 6.2, each respondent was asked to describe their response to the napkin shown (or in the case of intermediary users, supplied) to them. (refer Attachments 4 and 5), using the following specific survey questions:

- two best words (to describe this napkin).
- two worst words (to describe this napkin).
- what is important (to you in the use of a napkin).
- images (that spring to mind with this napkin).
- what key words (describe this napkin to you).

The responses were tabulated and frequency counted in a pareto style count. Examples of the results are included in Section 7.1, End User and Intermediary User Surveys, while the full table is detailed in Appendix 8.

Elapsed time for delivery

The intermediary user survey contained an interview question "Bearing in mind the

distance from the Manufacturing / Distribution source, what do you believe is a reasonable time from time of order to delivery of this napkin.?" This was to enable a comparison to be made to the BIA management delivery time standard of 48 hours, (refer section 1.2.2). The mean and standard deviation time in hours were calculated for all responses and by state.

6.2 Data processing

Using the "GB-Stat" statistics computer software package, the survey responses were entered onto a computerised master data base. A number of subsidiary data bases were created for analysis purposes and the mean and standard deviation was computed for responses to all statements in each section of the surveys, (Refer Appendix 9):

- Ranking of quality and customer service
- Ranking of the technical aspects of quality
- Napkin evaluation
- Interview questions

The mean and standard deviation was also calculated for responses to the statements in the delivery performance section of the intermediary survey. Each of the responses were then ranked by importance and graphed to give a visual perspective of the results, (Refer Appendix 10). The common statements of each survey were then compared to determine if significant differences in the mean between two groups existed (the two tailed t-test) using the formula:

$$Z = \frac{(X_1 - X_2)}{\sqrt{\dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}}}$$

where

X_1 = Sample mean of Population 1,

X_2 = Sample mean of population 2,

σ_1 = Standard deviation of population 1,

σ_2 = Standard deviation of population 2,

n_1 = Sample size of population 1,

n_2 = Sample size of population 2.

to test the null hypothesis that there was no difference between the groups, (Anderson et al, 1990, p 298). Results were compared to standard tables at a probability of 0.05 and a sample size of 60. At this level of significance, any result in excess of 1.671 would lead to rejection of the null hypothesis .

7.0 ANALYSIS OF RESULTS

This section presents the results of the surveys of the end users and the intermediary users, as well as analysis of the B.I.A. customer service survey. Comparisons are made between the end user and intermediary survey word responses and the Consensus Research marketing brand survey.

7.1 End User and Intermediary User Surveys

Table 7.1 is a summary of the results of the end user and intermediary user surveys. It lists the average of the responses for high series and low series end users and the intermediary users and compares them to each other.

TABLE 7.1 AVERAGE OF RESPONSES BY USER

Variable Name	High Series Endusers	Low Series Endusers	Intermed'y Endusers	Total Popul'n	Hi Series to Low series	Difference Intermed'y to Hi Series	Intermed'y to Low series
RANKING OF QUALITY & CUSTOMER SERVICE (%)							
Range	19	16.6	12.9	17.8	2.4	-6.1	-3.7
Size	14.1	14		14.1	0.1		
Colour	17.2	16.5		16.9	0.7		
Quality 1.	20.2	23.4	18.9	21.8	-3.2	-1.3	-4.5
Price	25.9	29.4	21	27.7	-3.5	-4.9	-8.4
RANKING OF THE TECHNICAL ASPECTS OF QUALITY (%)							
Tissue Colour	14.5	17.9	9.7	14.7	-3.4	-4.8	-8.2
Look	19.6	20.4	18.2	19.4	-0.8	-1.4	-2.2
Feel	19.2	18	15.6	17.9	1.2	-3.6	-2.4
Emboss Quality	10.9	9.5	9.6	10.1	1.4	-1.3	0.1
Fold Evenness	9.9	6.5	13.4	9.4	3.4	3.5	6.9
Surface Faults	11.1	10.9	11.8	11.2	0.2	0.7	0.9
Packet Fit	6.2	6.7	9.6	7.2	-0.5	3.4	2.9
Packaging	7.7	7.4	5.4	7.7	0.3	-2.3	-2
NAPKIN EVALUATION. (LIKERT SCALE)							
Image	3.42	3.2	3.23	3.29	0.22	-0.19	0.03
Emboss Quality	3.35	3.47	4.5	3.67	-0.12	1.15	1.03
Emboss Pattern	3.1	3.59	4.37	3.58	-0.49	1.27	0.78
Edges - Napkin	3.83	3.59	4.8	3.97	0.24	0.97	1.21
Edges - Packet	3.79	3.57	4.97	3.98	0.22	1.18	1.4
Creases/Wrinkles	4.65	4.65	5.43	4.84	0	0.78	0.78
Feel	5.73	5.59	5.77	5.68	0.14	0.04	0.18
INTERVIEW QUESTIONS.							
Packaging Type	2.02	1.92	2.2	1.99	0.84	0.18	0.28
Colour of Napkin	3.13	2.88	3.55	3.13	0.66	0.42	0.67

Table 7.2 lists the results of the *t*-test calculations as discussed in Section 6.2, Data Processing. Those exhibiting significant mean differences are highlighted. Full tabulation of the *t*-test results are listed in Appendix 11.

TABLE 7.2 SUMMARY OF *t* TEST CALCULATIONS.

			t-test Results		
Survey Item		Hi Series to Low - Mean Difference	Hi Series versus Lo Series	Intermediary versus Hi Series	Intermediary versus Lo Series
(By %)					
9	Range	2.4	0.8386	*-2.0137*	-1.1538
10	Size	0	0.0917		
11	Colour	0.7	0.2436		
12	Quality (1)	-3.2	-1.1479	-0.3678	-1.3814
13	Price	-3.5	-0.9812	-1.3209	*-1.9067*
(By %)					
22	Tissue	-3.4	-1.0073	*-2.1392*	*-2.4886*
23	Look	-0.8	-0.2279	-0.4595	-0.6434
24	Feel	1.2	0.4774	-1.6101	-0.9542
25	Emboss	1.4	0.5760	-0.7234	0.0271
26	Fold	3.4	*2.1098*	*1.8018*	*4.0058*
27	Faults	0.2	0.0901	0.3098	0.3527
28	Packet Fit	-0.5	-0.4322	1.6620	1.3818
29	Packaging	0.3	0.2087	*-1.7345*	-1.4024
(By Likert)					
30	Image	0.2	0.4905	-0.3905	0.0661
31	Emboss (2)	-0.1	-0.2944	*2.8100*	*2.5018*
32	Emboss Pattern	-0.5	-1.3216	*2.7951*	1.6024
33	Edges of Napkin	0.2	0.5397	*2.0999*	*2.7221*
34	Edges in Packet	0.2	0.5234	*2.6661*	*3.1109*
35	Creases	0	0.0135	*1.6198*	*1.6061*
36	Feel	0.1	0.4095	0.1090	0.5018
(By Likert)					
86	Packaging Type	0.1	0.2957	0.4422	0.6942
87	Colour Ranking	0.2	0.6334	1.0991	*1.8810*

Table 7.3 illustrates the average responses and ratios for high series and low series users compared with intermediary end users of one component of the survey, fold evenness in the technical aspects of quality section. Fold evenness was one of the responses which showed significant mean differences between all endusers, refer Section 6.2, Data Processing and Table 7.2, t test calculations.

Fig.7.3 COMPARISON OF END USER RESPONSES.

Technical Aspects of Quality.
Fold Evenness.

High Series End Users compared to Low Series End Users	Intermediary Users compared to High Series End Users	Intermediary Users compared to Low Series End Users

LEGEND

Hi Series End Users

Low Series End Users

Intermediary End Users

Ratio
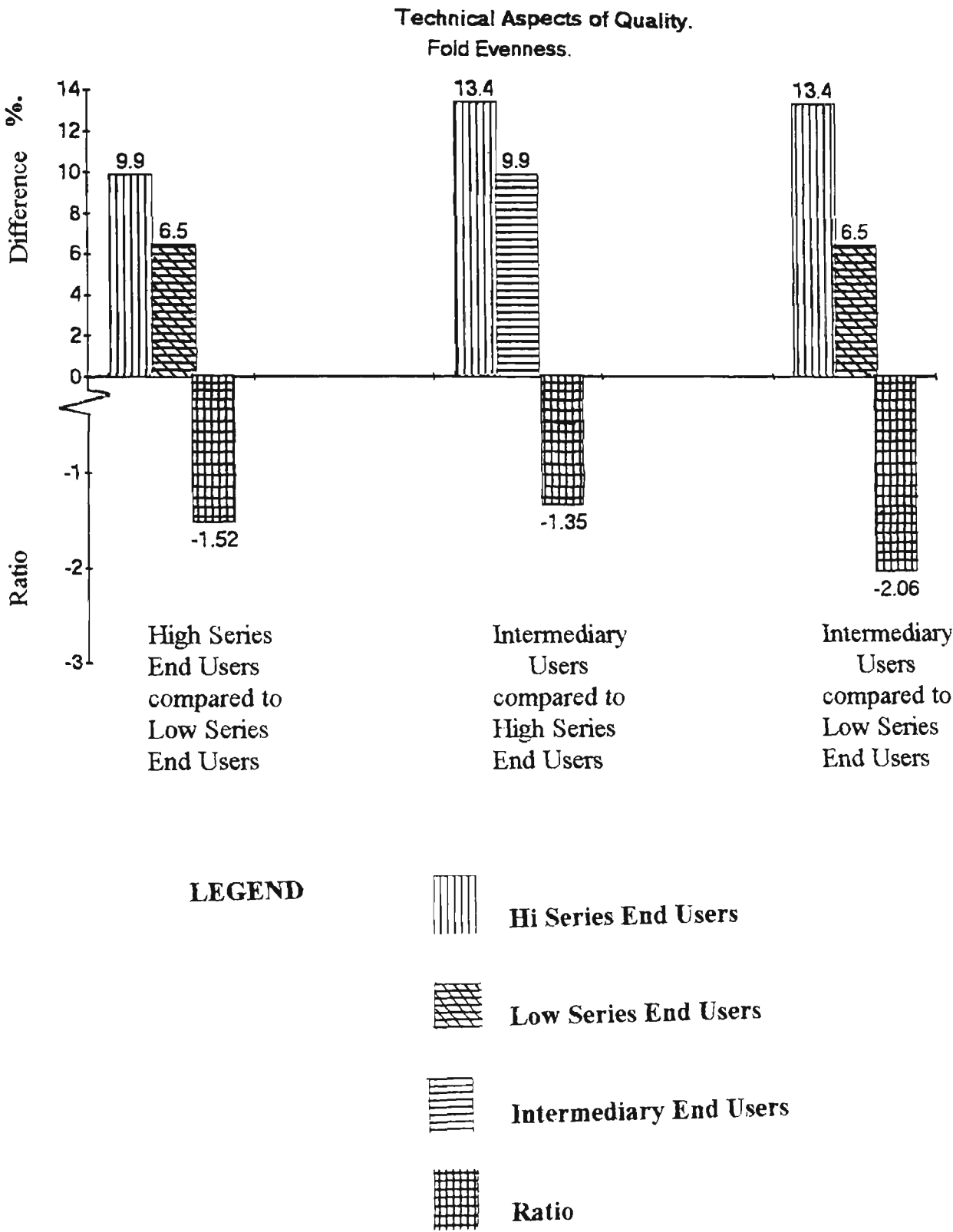
Table 7.4 lists the word responses from each of the surveys tabulated as discussed in Section 6.1.4, Recording.

TABLE 7.4 SUMMARY OF INTERVIEW QUESTION WORD RESPONSES.

Question	High Series	Low Series	Intermediary Users
Best Words	Softness Size	Softness Size	Size Quality
Worst Words	Lack of colour Thin	Thin Too small	Easily torn Embossing
Importance	Strength/Durability Absorbent	Strength/Durability Softness	Absorbent Softness
Images	Dinner Party Hygienic, clean	Take away/Fast food Dull, boring, plain	Clean Necessary (Customer Req't)
Key Words	Softness Plain, basic, ordinary	Softness Functional, practical	White, White paper Soft, softness

7.2 B.I.A. Customer Service Survey Responses

As discussed in Section 6.1.3, B.I.A. Customer Service Survey, table 7.5 compares the 5 items with the largest gaps for each group for comparison:

TABLE 7.5. B.I.A. SURVEY - COMPARISON OF RESPONSES BY GROUP.

Corporate Customers.

	Stock Avail.	Delivery Perf.	Overall Commun'n	Sales Rep'n	Invoice Accuracy
Perceived Importance.	95.5	91.8	83.0	86	86
Perceived Effectiveness.	51.0	53.8	55.8	59	68
Service gap.	44.5	38.0	27.2	27	18

Internal Customers. (Deeko Employees)

	Overall Commun'n	Stock Avail.	Delivery Perf.	Product Cond'n	Invoice Accuracy
Perceived Importance.	90.0	96.0	94.5	93	90
Perceived Effectiveness.	51.0	58.0	57.0	65	63
Service gap.	39.0	38.0	37.5	28	27

7.3 Comparison between Intermediary Survey and B.I.A. Customer Survey Word responses

Table 7.6 compares the responses of Intermediary Customers in the section of survey "The Ranking of Quality and Customer Service" to those of corporate customers in the BIA Customer Service survey.

TABLE 7.6 WORD RESPONSES - INTERMEDIARY CUSTOMERS VERSUS B.I.A. CORPORATE CUSTOMERS.

Ranking	Survey Intermediary Responses	BIA Customer Service survey.
1	Price	Stock availability
2	Quality	Delivery Performance
3	Delivery Performance	Product condition on delivery
4	Stock Availability	Sales representation
5	Range of products	Invoice accuracy
6	Invoice accuracy	Order entry process
7	Overall Communication	General admin Support
8	N/A	Range of Products
9	N/A	Custom printing.
10	N/A	Overall communication.

7.4 Discussion and findings

As discussed in Section 5.5.1 (Ranking),there were two survey sections which required respondents to allocate 100 points between a series of statements, ensuring

that respondents not only ranked them, but indicated the importance they attributed to each. The following example is extracted from Table 7.1 for low series end users. The 100 points allocated for the section 'Ranking of quality and customer service' were as follows:

Question No.	Question Heading.	Value.
9	Range	16.6
10	Size	14
11	Colour	16.5
12	Quality	23.4
13	Price	29.4
Total		100

Low series end users rated price (question 13), as the most important item, with the next highest item being quality. By comparison, while high series and corporate users also rated price as the most important item (refer section 7.1), high series users allocated 25.9 points, with the next item quality, being allocated 20.2 points. Intermediary users allocated 21 and 18.9 points respectively. The differences in mean ratings were considered indicative of true differences in customer requirements because they came from a sample of 48 responses, albeit with a high coefficient of variation. It was concluded that while all three groups ranked price as most important, low series end users were more aware of price and like intermediary users, were prepared to compromise product range. Corporate users were also more interested in stock availability and delivery than product range.

Similar results were found with low series end users in the section 'Ranking of the technical aspects of quality' (refer table 7.1):

Question No.	Question Heading	Value
22	Colour	17.9
23	Look	20.4
24	Feel	18
25	Emboss quality	9.5
26	Fold evenness	6.5
27	Lack of surface blemishes	10.9
28	Napkin fit in packet	6.7
29	Packet attractiveness	7.4
Total		97.3

Low series end users allocated 17.9 points to question 22, the colour of tissue used in a napkin while high series end users were less concerned, allocating 14.9 points. By comparison, intermediary users had less concern, allocating only 9.7 points.

The ranking of importance was the reverse with question 26, the concern about fold evenness in a napkin. At 6.5, low series end users had less concern for fold evenness than high series end users, who allocated 9.9 points. Intermediary users were more concerned with fold evenness, allocating the highest points, 13.4.

Based on the results as illustrated in Table 7.1, further indicative conclusions were drawn:

- High series users required a wider choice than intermediary users who used a limited range orientated towards their business. Low series users expected less choice in range than high series users.

- Low series users were more price conscious than intermediary users who valued the business relationship more than price. At the same time, high series users expected to pay more for perceived better features.

- both high and low series user rated product size and colour equally importantly, as well as the overall look of the napkin or impression created.

- both end user groups were more critical of the colour of the tissue used in the manufacture of napkins than intermediary users.

- intermediary users were more critical of how evenly a napkin was folded than users of high series napkins. The users of high series napkins in turn, were more critical of how evenly a napkin was folded than users of low series napkins.

- users of both low and high series napkins were more critical of the attractiveness of the packaging than intermediary users.

- intermediary users were more critical of the type of emboss pattern and the consistency of the embossing on a napkin than either of the end user groups.

- intermediary users were more critical of the matching of the folded edges of a napkin and how the napkin edges looked in a packet than either of the end user groups.

- intermediary users were more critical of small creases or wrinkles in the paper of a napkin than either of the end user groups.

- intermediary users agreed they wanted stock to be available at all times.

- intermediary users agreed they wanted deliveries on the date and time they specified.

- intermediary users objected to partial deliveries, even though on the date and time specified by them.

- a delivery time from order of 48 hours is more acceptable than 72 hours, although this varies by state to state, refer comments below on "Elapsed time for delivery'.

Interview questions
- In the ranking of "How important is the colour of this napkin" question, low series users were less critical of the colour of a napkin than either high series or corporate users.

Elapsed time for delivery
The mean and standard deviation time in hours were calculated for all responses and by state as follows:

	No. Responses	Mean Hrs.	Mean Days	Std. Deviation. Hrs.	Std. Deviation. Days	Mean minus 1 Std. Dev'n Hrs.	Mean minus 1 Std. Dev'n Days
Total Population	24	70	2.9	31	1.3	39	1.6
New South Wales	11	59	2.5	25	1.0	34	1.4
Victoria	8	87	3.6	34	1.4	53	2.2
Qld, South Australia	5	67	2.8	31	1.3	36	1.5

7.4.1 BIA Survey results

From the data obtained (refer Appendix 6) and samples shown in Table 7.4, the concerns expressed in Section 1.2.2 regarding the generality of the BIA customer service survey were confirmed. Of the 10 scales surveyed, Deeko employees rated 6 in the top 90%, 8 in the top 80%, rating almost everything as important. The perceptions of effectiveness by Deeko employees varied significantly enough to change the priorities of the 5 items with the largest service gaps, placing overall communication ahead of the two top corporate user concerns, stock availability and delivery performance. While a similar service gap was given by each group for delivery performance, Deeko employees significantly underestimated the importance of stock availability to corporate users.

Comparison between "The Ranking of Quality and Customer Service" and the corporate customer section of the B.I.A. customer service survey in Section 7.5. showed similar differences. The most highly ranked item in the Deeko survey, "Price" did not appear at all in the B.I.A. customer service survey. Of the four common statements, only "Delivery performance" and "Stock availability" featured prominently in each. "Invoice accuracy" ranked almost equally in each, but well down the scale, while a significant difference was noted in the ranking of "Range of products" between the surveys, it ranking much higher on the Deeko survey.

7.4.2 Consensus marketing brand survey results

As part of the identification of the order winning criteria for napkins, a comparison was made between the word responses obtained in the end user surveys and those from the Consensus marketing brand survey, (Section 1.2.1, Appendix 1), according to the two napkin types, high and low series. The end user survey responses were based on the pareto count discussed in Section 6.1.4, Recording.

High series napkins
There was commonality of the "best words" and "importance" from users of high series napkins of the survey and the Consensus brand audit.

Survey (High Series)		Brand audit
Best words	**What is Important**	
(from highest frequency to lowest)		
Softness	Strength	Formal
Size	Durability	Outstanding Quality
Embossing	Absorbent	- Thicker
Colour	Softness	- Most durable
Attractive	Texture	- Finest texture
Strength	Size	- Biggest
Quality	Quality	- Softest/smoothest
Absorbent	Attractive	Vibrant Colours

Low series napkins

There was little commonality between low series napkins and the Consensus report, the only common key words being "durability" and "price".

Survey (Low Series)		Brand audit
Best words	**What is Important**	
(from highest frequency to lowest)		
Softness	Strength	Informal
Size	Durability	Fair average quality
Colour	Softness	Thicker than housebrands
Emboss	Absorbent	More durable than housebrands
Strength	Size	Rough texture
Texture	Serves purpose	Not soft
Attractive	Clean & dry	Price
Price		Bland Colours
		Well established
		Borrowed credibility

The reason for this lack of consistency was the Consensus brand audit was a comparative study between high series (Deeko) and low series (Scott) napkins, rather than independent studies of each, as was the case for the end user surveys. No conclusions were able to be drawn therefore for low series napkins.

From these results it was concluded that the specific questions detailed in the Hypothesis could be answered. These are dealt with in Section 8, Conclusion.

8.0 CONCLUSIONS

This research set out to establish that, for different napkin product groups, quality and service meant different things to customers. To do this, three sub-hypotheses were developed and tested. The conclusions of the research are enumerated under each of these sub-hypotheses.

Customers purchasing napkins of different product groups had different expectations of quality. This was demonstrated in at least two areas:
- All customers expected quality. There was no significant difference in their *views*,
- however the standards of quality, based on the surveys showed that low series napkin end users had lower quality *expectations* than either high series napkin end users or intermediary users. For example, in the interview question of the ranking of colour, low series napkin consumers ranked significantly lower in their requirement, an *expectation* that lower price products would not be as white.

- All customers expected softness. No significant differences were found between the surveyed groups in responding to the statement "the softness and smooth feel of a napkin is very important to me." All customers rated this as an important feature they desired in the interview question "Can you explain to me what are the important things to you in the use of a napkin?" Yet with different napkins with significant differences in "hardness feel", all ranked "softness" at the top or second top in a "key word in describing this napkin." "Softness" was also the most used "best word" in the question, "Can you tell me what you consider to be the two best things about this napkin" by both napkin consumer groups, while being the seventh word with the intermediary napkin users. Clearly the expectation of softness was different between the groups.

Different customer (and product) groups have been shown to have different service requirements. While responses to both end user and intermediary user surveys rated price and quality as the most important in "The ranking of quality and customer service", the *t*-test calculations signify that intermediary end users ranked stock availability and delivery above product range, (refer Appendix 9)

It is possible to measure order winning criteria required by customers who purchase napkins from one paper converting company.

- Softness, stock availability and actual delivery times compared to the stated requirements of intermediary users were established as being measurable.

- Softness, emboss quality, fold evenness, the folded edges of a napkin and the napkin fit in a packet were established as being measurable for both high and low series napkin end users.

Each of the three sub-hypotheses used to test this thesis hypothesis were found to be proven, logically supporting the overall hypothesis.

9.0 POST SCRIPT

With the hypothesis being found proven, there was a need to further extend the conclusions and develop recommendations for the company to action. The recommendations made in this section generally apply to more than one part of the Hypothesis (Section 4). Consequently, they are made in order of priority for implementation, although where relevant, the appropriate question is indicated.

Delivery performance and stock holding

The surveys showed stock availability and delivery performance as the two most important issues requiring resolution. This agreed with the B.I.A. customer service survey which showed these items having the largest gaps in supplying the customers requirements. While current deliveries would appear to satisfy over 66% of intermediary users in supplying within 48 hours, a delivery time standard set by a supplier can not replace supplying stock to a customers requirements. The result was that 33% of customers did not have their delivery requirements met. In addition, none of the survey respondents differentiated between an "A" or "D" category product. Delivery performance was expected on all products as they considered their purchases to be equally important.

Accordingly a strategy to improve stock availability and delivery performance must be a priority for Deeko. Several options exist to achieve these, including:

Increase stock holding levels

An initial increase in stock holding would be inevitable, with an associated increase in operating costs. Ultimately this increase would be reduced by increased sales as a reputation for supply excellence became accepted, although the increase in stock holding on marginal profitable lines could not be justified. Any adverse effect created by increasing stock levels could be minimised by implementing and enforcing a stock holding and delivery promise system first on all "A" products, increasing stock turns and customer service on high gross profit products and minimising any adverse affect on R.O.I..

Feedback systems

Establishment of daily and monthly feedback systems to plant and warehouse personnel emphasising importance of stock availability and actual delivery performance to required dates would increase awareness of customer service,

currently missing on the shop floor. This should be supplemented by making employees and management accountable for stock availability and actual delivery performance through performance objectives and incentive schemes. Precision in establishment of the objectives to prevent building of unnecessary or obsolete stock would be required. One benefit of this aspect would be to improve communication, particularly for employees, the service gap which was highest in the BIA customer service survey.

Softness, feel

That further development be done on methods to improve the "feel" and softness of napkin tissue, to reduce the "rough, harsh, hard" comments. This change would allow a progressive upgrading of tissue softness across all grades, while allowing market differentiation activities to continue. A number of options exist to achieve this feature:

- changing the formulation of the tissue as manufactured in the paper mill. Increasing percentages of mechanically generated pulp or broke increases the hardness feel of tissue. Changes to chemically generated pulp or increased percentage of chemical pulp would improve softness.

- changing the manufacturing process to allow a layer of mechanical pulp between layers of chemical pulp. This would allow a blend of materials. Technology is available to manufacture tissue to this process and is used in Australia. However, the capital expenditure involved in building a new paper mill, (A$100 million plus) could preclude this option.

- the introduction of more "crepe" in the manufacturing process. One adverse feature of "crepe" is the difficulty of achieving an uninterrupted impression printing on a tissue surface which has heavy crepe, as well as the problem of stretching the web during printing and/or conversion to napkins. Excess tension during this process would give a higher yield per tonne, but eliminate a feature specially designed into the paper.

- the changing of emboss patterns to "bulk up" the web during the conversion process to napkins, particularly 1 ply. This would also have the effect of reducing the adverse comments regarding "thinness" of a napkin.

Manufacturing standards

- That relaxed standards be developed for the embossing of napkins. Embossing on multi ply napkins is necessary to ensure the plies adhere together during use and the current test method is considered to be appropriate. Provided the existing outcome is achieved however, changes in the depth and consistency of embossing of both multi ply and single ply napkins would be acceptable. The current standard and tolerances of the width of emboss on the edges of multi ply napkins would remain.

- That standards regarding the folds of napkins be changed and tightened reflect the results of the surveys, particularly for intermediary end user napkins. As the same machines may be used to supply both end user and intermediary user napkins, this may translate into an overall increase in standards. This will necessitate further training of both engineering fitters and machine operators in the requirements regarding folds and tolerances. As the process is machine dominated, machine capability studies to confirm the adherence to standards during subsequent production would also be required.

Embossed corporate logos

That newly designed embossing systems be developed which could incorporate personalised logos, reduce printing and add value to a commodity product for a fast food company.

Stock holding policy

- change in marketing policy to exclude all "C" and "D" items from stock ranges and advertise them as make to order only. While a longer manufacturing and delivery lead time would be quoted, say 3 - 4 weeks, the customer service feature would be the guaranteeing that delivery was made on or before the quoted date once made *and accepted by the customer*. This would improve customer relations and communication, satisfying both the corporate user survey and the BIA customer service survey findings.

Reduction in product range

The elimination of low G.P. products reducing or diluting the companies R.O.I. would be beneficial for some divisions as the customer service "gap analysis" indicated that customers generally were satisfied with the product range. However

product range featured highly in the ranking by end users in the section of "Ranking of quality and customer service", while lower for intermediary users. Major reductions in product range would appear to be limited, or at least would have to be specifically targeted. Examples where product rationalisation could be effective include:

- the elimination of 1 ply dinner quarter fold and G.T. napkins from the range. Sales are not sufficient to cover administrative costs, particularly if custom printed.

- as a marketing strategy, rationalise the market for serv-u-rite and snak-nap napkins, either through pricing or better, in conjunction with implementing a strategy of 'trading in' napkin dispenser units and replacing them, to upgrade users to econoserve napkins. This would reduce the product complexity, reduce fold change set-ups on production machines and force competitors to either follow or supply unique dispenser units at their cost.

Printing
That the current process of adding print designs to plain white 1 ply napkins to improve customer acceptance be extended, to add value and build on positive comments "bright, pretty, attractive."

McDonalds napkins
Communication and training is needed for McDonalds personnel involved in loading napkin dispensers in stores. Adverse comments were made by McDonalds respondents regarding napkins tearing, or small pieces of tissue being found in the stores. Later investigation found that loading excessive numbers of napkins into dispensers created pressure in the dispenser, resulting in the napkins tearing when being removed. One method to reduce this would be to alter the pack size to approximately 85% of the dispenser capacity so that loading could be done in plenty of time before the dispensers run out, yet not overloading the dispensers.

The implementation of these recommendations would achieve the objective of improving Customer Quality and Service requirements, in line with the findings of this thesis.

REFERENCES

Adam, Everett E., Ebert, Ronald J, 1989, *Production and Operations Management*, Prentice Hall, New Jersey.

Albrecht, Karl. 1992 a, *The Only Thing That Matters*, Harper Collins Publishers, New York.

Albrecht, Karl. 1992 b, *At America's Service; How Your Company Can Join the Customer Service Revolution*, Warner Books, New York.

Altany, David. 1990, **One Step Beyond Customer Satisfaction**, *Industry Week*, September 3, pp. 11-15.

Anderson, D.R., Sweeney, D.J., Williams, T.A., Harrison, N.J., Rickard, J.A., 1990, *Statistics for Business Management and Economists*, Harper and Row, Sydney.

Anonymous, 1993, **Measure for Measure,** *American Printer*, Vol. 210, Issue 4, January, pp. 59-62.

Babich, Peter. 1992, **Customer Satisfaction: How Good is Good Enough?,** *Quality Progress*, December, pp. 65-67.

Bailey, Keith. Dunn, Karen, 1991, **Six Keys to Quality Service,** *Executive Excellence*, Vol. 8, Issue 7, July, pp. 14.

Band, William. 1990, **Performance metrics Keep Customer Satisfaction Programs on Track,** *Marketing News*, Vol. 24, Issue 11, May, pp. 12.

Barrell, Alan., 1992, **Relationship Marketing: way ahead for the 90's?,** *Business Marketing Digest (IMD)*, Vol. 17, Issue 3, third quarter, pp. 49 - 54.

Becker, Selwyn W,. 1993, **TQM Does Work: Ten Reasons Why Misguided Attempts Fail,** *Management Review*, May, pp. 30-33.

Bishop, George F. 1990, **Issue Involvement and Response Effects in Public Opinion Surveys,** *Public Opinion Quarterly (POQ),* Vol.54, Summer, pp. 209- 218.

Blakemore, John. *'The Champion of Quality,'* NIES, 1991.

Bowen, David E., Siehl, Caren., Schneider, Benjamin. 1989, **A Framework for Analysing Customer Service orientations in Manufacturing,** *Academy of Management Review,* Vol.14, No.1, pp. 75-95.

Brown, Mark G. 1990, **Defining Customer Requirements: Service Quality Deployment,** *Journal for Quality and Participation (QCJ),* March, pp. 98-104.

Brown, Stanley A. 1992, *Total Quality Service,* Prentice Hall, Canada.

Caudron, Shari. 1991, **How Xerox Won the Baldrige,** *Personnel Journal (PEJ),* Vol. 70, Issue 4, April, pp. 98-102.

Cavaness, Joseph. P, **Manoochehri,** G. H., 1993, **Building Quality into Services,** *SAM Advanced management Journal (AMJ),* Vol. 58, Issue 1, Winter, pp 4 - 8+.

Consensus Research, 1991, *Brand Audit for the Deeko and Scott Brands,* Melbourne. (Confidential Report, restricted circulation.)

Cravens, David. W., Holland, Charles. W., Lamb, Charles W., Moncrief, William C. 1988, **Marketing's Role in product and Service. Quality,** *Industrial Marketing Management (IMM),* Vol 17, Issue 4, November, pp. 285-304.

Coulson-Thomas, Colin. 1991, **Beyond Quality,** *Management Services (MNS),* Vol. 35, March, pp. 16-19.

Davis, Tim R.V., 1994, **Benchmarks of Customer Satisfaction Measurement: Honeywell, Toyota and Corning,** *Planning Review,* Vol. 22, Issue 3, May/June, pp. 38 - 41

Deming, W. Edward. 1986, *Out of the Crisis*, Cambridge University, Cambridge, U.K..

Encyclopaedia Britannica, 1964, **Paper**, Vol. 17, pp 231.

Ferguson, Gary A. 1990, **Printer Incorporates Deming - Reduces Errors, Increases Productivity,** *Industrial Engineering,* Vol. 22, Issue 8, August, pp. 32-34.

Friedman, Philip, 1991, *GB - STAT*, Dynamic Microsystems, Inc., Silver Spring, Maryland, U.S.A.

Georgantzas, Nicholas. C., 1994, **Service Designs for Quality: Integrated Process Necessity,** *The Mid - Atlantic Journal of Business (JBZ),* Vol. 30, No. 1, March, pp. 55 - 80.

Hayes, R.H., Wheelwright, Steven. C., 1979, **Link Manufacturing Process and Product Life Cycles,** *Harvard Business Review,* No. 57 (Jan -Feb), pp133 - 140.

Hill, Terry, 1989, *Manufacturing Strategy: Text and cases*, Richard Irwin Inc. New York.

Johns, Nick, 1992, **Quality Management in the Hospitality industry: Part2. Applications, Systems and Techniques,** *International Journal of Contemporary Hospitality Management (IJH),* Vol. 4, Issue 4, pp. 3 - 7.

Klopp, Charlotte, Sterlicchi, John. 1989, **Customer Satisfaction Just Catching On in Europe,** *Marketing News (MNW),* Vol. 24, Issue 11, May 28, pp 5.

Kochan, Anna., 1992, **'Image Focus',** *Managing Service Quality, (MAQ),* Vol. 2, Issue 3, March, pp. 173 - 174.

Krajewski, Lee. J., Ritzman, Larry. P.,1993, *Operations Management* Addison-Wesley Publishing, Massachusetts.

Lewis, Geoffrey, 1993, *Australian Strategic Management : Concepts, context and cases,* Prentice Hall, Melbourne.

Martin, Christopher., **Payne.** Adrian., **Ballantyne**, David., 1991, *Relationship Marketing*, Butterworth, London.

Maskell, Brian. 1989, **Performance Measurement for World Class Manufacturing**, *Management Accounting-London*, Vol. 67, Issue 7, July/Aug. pp. 48-50.

McDonnell, John.,1994, **'The Route to Total Quality Management - Part two'**, *'Managing Service Quality (MAQ)Vol. 4, Issue 4*, pp. 45-50.

Mintzberg, Henry, **Quinn**, James, B, 1992, *The Strategy Process - Concepts and Contexts*, Prentice-Hall Inc., New Jersey.

Nahmais, Steven, 1989, *Production and Operations Analysis*, Richard Irwin Inc., New York.

Ohmae, Kenichi. 1983, *The Mind of the Strategist*, Penguin Books, New York.

Platts, K. W., **Gregory**, M. J., 1990, **Manufacturing Audit in the Process of Strategy Formulation**, *International Journal of Operations & Production Management, (IJOPM)*, Vol. 10, issue 9, pp 5 - 26.

Rigotti, Stefano, **Pitt**, Leyland. 1992, **SERVQUAL as a Measuring Instrument for Service Provider Gaps in Business Schools**, *Management Research News*, Vol. 15, Issue 3, pp. 9-17.

Robbins, Stephen P., **Barnwell**, Neil S. 1989, *Organisation Theory in Australia*, Prentice Hall, Australia.

Ross, D.A., General Manager, Bowater Deeko, **Interviews**, August, 1994.

Ryan, B, Manager Contract Sales, Bowater Deeko, **Interviews**, August, October, 1994.

Schaffer Patricia D. 1990-1, **Quality Service-Our Most Important Product - People-Our Most Important Resource**, *Management Quarterly (MQU)*, Vol. 31, Issue 4, Winter, pp. 44-46.

Sekaren, Uma, 1992, *Research Methods for Business*, John Wiley & Sons, New York.

Shaw, M, Quality Manager, Bowater Tissue, Bowater Industries Australia, **Interviews,** October, November, 1994.

Skinner, W., 1978, *Manufacturing in the Corporate Strategy*, John Wiley & Sons, New York.

Slack, Nigel, 1994, **The Importance-Performance Matrix as a Determinant of Improvement Priority,** *International Journal of Operations & Production Management, (IJOPM),* Vol.14, No.5, pp59-75.

Slack, Nigel, 1991, *The Manufacturing Advantage: Achieving Competitive Manufacturing Operations*, Mercury Books, London.

Sloan Alfred P. Jnr. 1972, *My Years with General Motors,* Anchor Books, New York.

Sohal, Amrik S., **Ramsey,** Liz., **Samson,** Danny. 1991, **Quality Management in Australian Industry,** TQMI Conference, *Monash University, Melbourne.*

Sugimori, Y., Kusunoki, K., Cho, F., Uchikawa, S., 1982, **Toyota Production System and Kanban System: Materialization of Just-in-time and Respect for Human System,** *4th International Conference on Production Research (Tokyo)* Taylor and Francis, London.

Varley, Helen. 1988, *Colour,* Marshall Editions Limited, London.

Wallace, Douglas M. 1993, **Determination of Quality at Bowater Deeko,** Post-graduate Diploma Project, (unpublished), *Victoria University of Technology, Melbourne.*

Wallace, Douglas M. 1994, **Determination of Quality at Bowater Deeko,** Project Proposal, Masters Project, (unpublished), *Victoria University of Technology, Melbourne.*

Ziethaml, Valerie A., **Parasuraman**, A., **Berry**, Leonard L. 1990, *Delivering Quality Service, Balancing Customer Perceptions and Expectations,* The Free Press, New York.

Ziethaml, Valerie A., **Parasuraman**, A., **Berry**, Leonard L. 1994, **Improving Service Quality in America: Lessons Learned,** *Academy of Management Executive,* Vol. 8, No. 2, pp32 - 44.

<u>**NAPKIN COMPARISON.**</u>

Based on CONSENSUS Research.
(Numbered items ranked by importance.)

<u>3 PLY (DEEKO) SERVIETTES.</u>

<u>1. FORMAL</u>
>
> <u>Best for Dinner Parties.</u>
>> Positive Feedback.
>>> Self Esteem.
>> Self Referenced.
>>> Self Pride.
>
> <u>Expensive but affordable.</u>
>> Reputation on line.
>>> Justify Cost

<u>2. OUTSTANDING QUALITY</u>
>
> <u>Thicker.</u>
>> Unlikely to fail.
>>> Feel Safe.
>
> <u>Most Durable.</u>
>> Greasy / Finger Absorbency.
>>> Feel Safe.
>
> <u>Finest Texture.</u>
>> Aesthetics.
>>> Feel Special.
>
> <u>Biggest.</u>
>> Best Protection.
>>> Feel Secure.
>
> <u>Softest / Smoothest.</u>
>> Good to touch.
>>> Feel Pampered.
>
> <u>Up-market Packaging.</u>
>> Stands Out.
>>> Feel Special.

3. VIBRANT COLOURS
>
> <u>Positive Feedback.</u>
>> Self Esteem.
>
> <u>Self Referenced.</u>
>> Self pride.

NAPKIN COMPARISON.

Based on CONSENSUS Research.
(Numbered items ranked by importance.)

1 PLY (SCOTT) SERVIETTES.

1. INFORMAL
   Family / Everyday
       Adequate performance.
         Value for money.
         Good manager.
       Not on Show.
         No Feedback.
           Self Esteem Irrelevant.

2. FAIR AVERAGE QUALITY
   Thicker than housebrands.
       Feel Relatively Safe.
         Pragmatism.
   More Durable than Housebrands.
       Feel Relatively Safe.
         Pragmatism.
   Rough Texture.
       Visible Fibres.
         Pragmatism.
   Not Soft.
       Not Pampered.
   Price.
       Feel Justified.
         Good Manager.

3. BLAND COLOURS
   Not Bright
       No Positive Feedback.
   Pastels.
       Not Modern.
         Feel Down Market.
   Patterns.
       Not Modern.
         Feel Down Market.

4. WELL ESTABLISHED.
   Proven Credentials.
       Reliable.
         Trusted Brand.

5. BORROWED CREDIBILITY
   Lady Scott Connection?
       Feel Pampered.
   Scotty?
       Tissue expertise.
   Bowater Scott?
       Paper expertise.

NAPKIN COMPARISON.

Based on CONSENSUS Research.
(Numbered items ranked by importance.)

PAPER SERVIETTES.

1. CONTINGENT ON TASK.
   Formal
       High Quality.
           Strength
               Thickness.
                   Avoid Failure.
                       Feel safe.
               Durability.
                   Greasy Finger Test.
                   Avoid Failure.
                       Feel safe.
               Absorbency.
                   Cope with Catastrophes.
                       Feel safe
           Texture.
               Visual / Touch.
                   Aesthetics.
                       Feel Special
           Ply Rating.
               3 Better than 1.
                   No Understanding.
           Size.
               Protection.
                   Feel Secure.
           Softness.
               Smooth to Touch.
                   Feel Pampered.
           Price.
               Value depends on Task.
                   Feel extravagent.
                   Feel Justified.
                       Good Manager.
       On Show.
           Positive Feedback.
               High Self - Esteem.

CONTINGENT ON TASK. (Cont'd)

Informal

Fair / Average Quality.

Gets job done.

Pragmatism.

Efficient Manager.

Strength

Thickness.

Avoid Failure.

Feel safe.

Durability.

Greasy Finger Test.

Avoid Failure.

Feel safe.

Absorbency.

Cope with Catastrophes.

Feel safe

Texture.

Visual / Touch.

Aesthetics.

Feel Special

Ply Rating.

3 Better than 1.

No Understanding.

Size.

Protection.

Feel Secure.

Softness.

Smooth to Touch.

Feel Pampered.

Price.

Value depends on Task.

Feel Justified.

Good Manager.

Feel extravagent.

2. COLOURS

Co-ordinated.

Positive Feedback.

Self Esteem.

Self Referenced.

Self Pride.

Bright.

Positive Feedback.

Self Esteem.

Self Referenced.

Self Pride.

Pastels.

Not Modern.

Feel down Market.

2. COLOURS (Cont'd)

    Patterns.
        Not Modern.
            Feel down Market.
    Ecological Considerations.
        Polluted Environment.
            Feel Guilty.

3. CONVENIENCE
    Cleanliness.
        Clean up.
            Disposable.
                Feel Virtuous.
    Hygenic.
        Disposable.
            Protect Family.
                Feel Safe.
    Time Saving.
        No Washing.
            Efficient Time Management.
            In Control.
    Less Work.
        Other Demands / pursuits.
            Busy Lifestyle.
                Feel Competent.

4. ENVIRONMENTAL CONSIDERATIONS.
    Linen.
        Less Damaging.
            Feel Virtuous.
         Must use Chemicals.
            Feel Guilty.
    Recycled Serviettes.
        Obviously Better.
            Drive Preference.
        Cost More?
            Hip Pocket.
    Normal serviettes.
        Balancing Pros / Cons.
            Rational Emotional Dilemma.

PRODUCT GROUP - NAPKINS.

1993 VOLUMES ($000) - by Type, Fold & Ply.

		Quarter	Offset 1/4	Offset 8	Serv-u-rite	Snaknap	Econo-serve	M / 8 Fold	Pocket	G.T.	TOTALS
DINNER											
3 Ply		5465								217	5682
	%	18								1	19
2 Ply		1174								257	1431
	%	4								1	5
1 Ply		9								8	17
	%	0								0	0
LUNCHEON											
3 Ply		0								131	131
	%	0								0	0
2 Ply		6259						522			6781
	%	21						2			22
1 Ply		8045	2197	1336	268	333	1407	1587			15173
	%	27	7	4	1	1	5	5			50
COCKTAIL											
3 Ply		68								68	68
	%	0								0	0
2 Ply		915								915	915
	%	3								3	3
1 Ply		40								40	40
	%	0								0	0
TOTALS		21975	2197	1336	268	333	1407	2109	0	613	30238
	%	73	7	4	1	1	5	7	0	2	100

Prototypic Characteristics of Manufacturing Production and Delivery.
- Tangible output
- Standardised output.
- Technical core buffered from the customer
- Inventory of goods consumed at a later point in time
- Capital Intensive

Manufacturing Orientations in Service Firms
- Physical goods as a component of service package
- Manufacturing logic in back-room office service operations
- Service Factory.
- Automation of Services.
- Production line approach to service
- De-professionalism of service product & delivery

Service Orientations in Manufacturing Firms
- Customer Service as:-
(a) Component of product
(b) Element of product strategy.
- Incorporate sevice-orientated goals in firms strategy.
- Adopt appropriate service organisation arrangements.

Prototypic Characteristics of Service production and Delivery.
- Intangible output
- Customised output
- Customer participation.
- Simultaneity of prod'n and consumption.
- Labour Intensive.

The Merging of Service & Manufacturing Orientations.
(Bowen, Seibl & Schneider, Academy of Management review, 1989, Vol. 1, p77.)

<u>END USER SURVEY.</u>

<u>NAPKIN QUALITY AND SERVICE</u>.

This survey is to find out about what you feel are the important factors in the supply of napkins to you, our Customers. We also ask you to tell us how well you think we meet those expectations.

BACKGROUND INFORMATION.

Please circle the number that most appropriately describes you.

1. | 1 | Female. | 2 | Male.

2.   <u>Age grouping.</u>

| 1 | Under 25. | 3 | 36 - 45 years.

| 2 | 26 - 35 years. | 4 | Over 45 years.

3.   Are you the person who does most of the shopping for your regular supplies in your family unit?

| 1 | Yes. | 2 | No.

4.   Are you the major breadwinner in your family unit.?

| 1 | Yes. | 2 | No. | 3 | Equal.

5. Your Residential Postcode.

      |__|__|__|__|

2.

> The first part of this survey asks you to consider two aspects of quality. We want you to allocate 100 points among the features listed in each group, according to how important each feature is to you - the more important the feature, the more points you should allocate to it. Please make sure the points you allocate in each group total 100. Remember, there are no right or wrong answers - what we are interested in is your ranking of the features and the gap between them.

6. RANKING OF QUALITY AND CUSTOMER SERVICE.

1. Product Range: must be suitable for your needs. _____ Points

2. Size or product dimensions. _____ Points

3. Colour. _____ Points

4. Quality: the product meets or exceeds its purpose. _____ Points

5. Price. _____ Points

TOTAL   100   Points.

7. RANKING OF THE TECHNICAL ASPECTS OF QUALITY

1. The colour of the tissue used in manufacture. _____ Points

2. The overall look of the napkin, the impressions created. _____ Points

3. How the napkin feels to you, the softness, texture etc. _____ Points

4. The quality of the embossing on the napkin. _____ Points

5. How evenly the napkins are folded. _____ Points

6. Lack of surface blemishes on the napkin,
   e.g. creases, pin holes _____ Points

7. How well the napkins fit in the packet. _____ Points

8. Attractiveness of the packaging. _____ Points

TOTAL   100   Points.

3.

8. NAPKIN EVALUATION.

Based on your experiences and feelings as a purchaser, user or consumer of napkins, we want you to show us what is important to you about **this** napkin. Selection of a number tells us how important each statement is to you. If you *strongly disagree* with the statement, circle 1. If you *strongly agree* with the statement, circle 7. If your feelings are less strong, circle one of the numbers in the middle. There are no right or wrong answers - all we are interested in is a number that truly reflects your feelings.

		Strongly Disagree						Strongly Agree
1.	I choose a napkin because of the image it creates for me.	1	2	3	4	5	6	7
2.	The consistency of the embossing on the surface of the napkin is important to me.	1	2	3	4	5	6	7
3.	The type of emboss pattern on the napkin is important to me.	1	2	3	4	5	6	7
4.	The edges of my folded napkin must match exactly.	1	2	3	4	5	6	7
5.	The edges of all the napkins in the packet must look even.	1	2	3	4	5	6	7
6.	Small creases or wrinkles in the paper of my napkin are *not important* to me.	1	2	3	4	5	6	7
7.	The softness and smooth feel of a napkin is very important to me.	1	2	3	4	5	6	7

<u>**4.**</u>

9. INTERVIEW QUESTIONS.

1. Can you tell me what you consider to be the two best things about this napkin?

   _____

2. Can you tell me what you consider to be the two worst things about this napkin?

   _____

3. Can you explain to me what are the important things to you in the use of a napkin?

   _____

4. What are the images that spring to mind to you with this napkin?

   _____

5. What are the key words you would use in describing this napkin?

   _____

6. How much influence on you does the packaging type and quality have on the selection of this napkin?

   None.   A lot.
      0_____1_____2_____3_____4_____5

7. How important to you is the colour of this napkin?

   Not important.   Very important.
      0_____1_____2_____3_____4_____5

8. On what criteria did you base your decision?

   _____

NAPKIN QUALITY AND SERVICE SURVEY.

This survey is to find out about what you feel are the important factors in the supply of napkins to you, our Customers. We also ask you to tell us how well you think we meet those expectations.

BACKGROUND INFORMATION.

1. Please circle the number that most appropriately describes your company.

   | 1 | Airline - Airline caterer.

   | 2 | Food Service - Restaurant / Take-away.

   | 3 | Food Service - Fast food / Take -away.

   | 4 | Distributor.

   | 5 | Other - Identify.

   _____

2. Please circle the number which most appropriately describes you.

   | 1 | General Manager - C.E.O.

   | 2 | Buyer - Purchasing Agent.

   | 3 | Store Manager.

   | 4 | Sales.

   | 5 | Marketing.

   | 6 | Manufacturing

   | 7 | Other - Identify. _____

3. Please circle the number that describes your location.

NSW./ACT	VIC.	QLD	S.A./N.T.	W.A.	TAS
	1			2			3			4			5			6	

2.

> The first part of this survey asks you to consider two aspects of quality. We want you to allocate 100 points among the features listed in each group, according to how important each feature is to you - the more important the feature, the more points you should allocate to it. Please make sure the points you allocate in each group total 100. Remember, there are no right or wrong answers - what we are interested in is your ranking of the features and the gaps between them.

4. RANKING OF QUALITY AND CUSTOMER SERVICE.

1. Product Range: must be suitable for your needs. _____ Points

2. Stock availability: available when required. _____ Points

3. Delivery: what is ordered, is delivered on time, in time. _____ Points

4. _Quality: the product meets or exceeds its purpose. _____ Points

5. Price. _____ Points

6. Accuracy & reliability: information, pricing, invoices. _____ Points

7. Communication: regular, meaningful, & effective. _____ Points

TOTAL   100   Points.

5. RANKING OF THE TECHNICAL ASPECTS OF QUALITY

1. The colour of the tissue used in manufacture. _____ Points

2. The overall look of the napkin, the impressions created. _____ Points

3. How the napkin feels to you, the softness, texture etc. _____ Points

4. The quality of the embossing on the napkin. _____ Points

5. How evenly the napkins are folded. _____ Points

6. Lack of surface blemishes on the napkin, e.g., creases and pin holes. _____ Points

7. How well the napkins fit in the packet. _____ Points

8. Attractiveness of the packaging. _____ Points

TOTAL   100   Points.

3.

6. NAPKIN EVALUATION.

> Based on your experiences and feelings as a purchaser, user or consumer of napkins, we want you to show us what is important to you about **this** napkin. Selection of a number tells us how important each statement is to you. If you *strongly disagree* with the statement, circle 1. If you *strongly agree* with the statement, circle 7. If your feelings are less strong, circle one of the numbers in the middle. There are no right or wrong answers - all we are interested in is a number that truly reflects your feelings.

		Strongly Disagree						Strongly Agree
1.	I choose a napkin because of the image it creates for me.	1	2	3	4	5	6	7
2.	The consistency of the embossing on the surface of the napkin is important to me.	1	2	3	4	5	6	7
3.	The type of emboss pattern on the napkin is important to me.	1	2	3	4	5	6	7
4.	The edges of my folded napkin must match exactly.	1	2	3	4	5	6	7
5.	The edges of all the napkins in the packet must look even.	1	2	3	4	5	6	7
6.	Small creases or wrinkles in the paper of my napkin are *not important* to me.	1	2	3	4	5	6	7
7.	The softness and smooth feel of a napkin is very important to me.	1	2	3	4	5	6	7

<u>4.</u>

7. DELIVERY PERFORMANCE.

Based on your requirements as a purchaser of napkins, we want you to show us what is important to you about the **delivery service** of napkins. Selection of a number tells us how important each statement is to you. If you *strongly disagree* with the statement, circle 1. If you *strongly agree* with the statement, circle 7. If your feelings are less strong, circle one of the numbers in the middle. Remember, there are no right or wrong answers - all we are interested in is the number that truly reflects your feelings.

		Strongly Disagree						Strongly Agree
1.	The delivery should be on the date and time I specify.	1	2	3	4	5	6	7
2.	Stocks should be available at all times.	1	2	3	4	5	6	7
3.	Orders should be delivered within 48 hours of ordering.	1	2	3	4	5	6	7
4.	Order can be delivered up to to 72 hours from ordering.	1	2	3	4	5	6	7
5.	The time between order and delivery is not as important as keeping delivery promises.	1	2	3	4	5	6	7
6.	Partial deliveries of my order are acceptable provided the delivery date is met.	1	2	3	4	5	6	7

<u>5.</u>

8. INTERVIEW QUESTIONS.

1. Can you tell me what you consider to be the two best things about this napkin?

    _____

2. Can you tell me what you consider to be the two worst things about this napkin?

    _____

3. Can you explain to me what are the important things to you in the use of a napkin?

    _____

4. What are the images that spring to mind to you with this napkin?

    _____

5. What are the key words you would use in describing this napkin?

    _____

6. How much influence on you does the packaging type and quality have on the selection of this napkin?

None.   A lot.
    0_____1_____2_____3_____4_____5

7. Bearing in mind the distance from the manufacturing / distribution source, what do you believe   is a reasonable time from time of order to delivery of this napkin?

    _____

8. How important to you is the colour of this napkin?

Not important.   Very important.
    0_____1_____2_____3_____4_____5

9. On what criteria did you base your decision?

    _____

BOWATER INDUSTRIES AUSTRALIA

CUSTOMER AND STAFF SURVEYS

KEY RESEARCH FINDINGS

** Corporate Customers

ITEM	Delivery Perf.	Order entry process	Stock Avail.	Product Line & Features	Sales Represent'n	Product Condition on dely.	Invoice Accuracy	General Admin. Support	Custom Printing.	Overall Commun'n.	Overall Customer Service
IMPORTANCE											
Deeko Employees	94.5	86.5	96	85	90	93	90	77.5	65	90	95
Retail **	94	75	96	68	87	86	85	70.5	70.5	83	90
Commercial **	89.5	81	95	71	85	89	87	77.5	68	83	87
EFFECTIVENESS											
Deeko Employees	57	60	58	68	66	65	63	59	52	51	61.5
Retail **	52.5	61	52	65	62	76	67	62	62	62	59
Commercial **	55	61	50	60	56	68	69	60	58	49.5	56
SERVICE GAP											
Deeko Employees	37.5	26.5	38	17	24	28	27	18.5	13	39	33.5
Retail **	41.5	14	44	3	25	10	18	8.5	8.5	21	31
Commercial **	34.5	20	45	11	29	21	18	17.5	10	33.5	31
AVERAGE GAP	38	20	42	10	26	20	21	15	11	31	32
RANK	2	6	1	9	4	6	5	7	8	3	
AVERAGE IMPORTANCE FOR RETAIL & COMMERCIAL (CORPORATE CUSTOMERS)	91.8	78.0	95.5	69.5	86.0	87.5	86.0	74.0	69.3	83.0	88.5
RANK	2	6	1	8	4	3	5	7	9	10	

SURVEY CODING MASTER SHEET.

END USER SURVEY.

Column No.	Item. Comments.	Coding.	
1 - 3	Questionnaire No.		
4	Sex	1= Female, 2= Male.	
5	Age	1= Under 25, 2= 26 - 35 years, 3= 36 - 45 years, 4= Over 45 years	
6	Regular Shopper	1= Yes, 2= No	
7	Major breadwinner	1= Yes, 2= No, 3= Equal	
8	Post Code	Enter Code	
9	Product Range	Enter Values.)	
10	Size	Enter Values.)	Totals
11	Colour	Enter Values.)	must
12	Quality	Enter Values.)	equal
13	Price	Enter Values.)	100

INTERMEDIARY SURVEY.

Column No.	Item. Comments.	Coding.
50	Company Type	1= Airline, 2= Food service - restaurant take-away, 3= Food service - fast food take-away, 4= Distributor, 5= Other
51	Respondent Title	1= GM, CEO, 2= Buyer, PA, 3= Store Mgr, 4= Sales, 5= Marketing, 6= Manufacturing, 7= Other
52	State location	1= NSW / ACT, 2= Vic, 3= Qld, 4= SA /NT, 5= WA, 6= Tas

INTERMEDIARY SURVEY (Cont'd)

Column No.	Item. Comments.	Coding.	
9	Product Range	Enter Values.)	
53	Stock Availability	Enter Values.)	Totals
54	Delivery	Enter Values.)	must
12	Quality	Enter Values.)	equal
13	Price	Enter Values.)	100
55	Accuracy & Reliability	Enter Values)	
56	Communication	Enter Values)	
57	Delivery when specified	1= Disagree -> 7= Agree	
58	Stock availibility	1= Disagree -> 7= Agree	
59	Delivery within 48 hrs.	1= Disagree -> 7= Agree	
60	Delivery up to 72 hrs.	1= Disagree -> 7= Agree	
61	Delivery promise importance	1= Disagree -> 7= Agree	
62	Partial delivery acceptance	1= Disagree -> 7= Agree	

COMMON SURVEY.

Column No.	Item. Comments.	Coding.	
22	Colour	Enter Values.)	
23	Impression	Enter Values.)	
24	Feel	Enter Values.)	
25	Embossing	Enter Values.)	Totals
26	Folding	Enter Values.)	must
27	Blemishes	Enter Values.)	equal
28	Packet fit	Enter Values.)	100
29	Packaging	Enter Values.)	
30	Napkin Image	1= Disagree -> 7= Agree	
31	Embossing	1= Disagree -> 7= Agree	
32	Pattern	1= Disagree -> 7= Agree	
33	Edges - Napkin	1= Disagree -> 7= Agree	
34	Edges - Packet	1= Disagree -> 7= Agree	
35	Wrinkles	**7= Disagree -> 1= Agree **	Reverse Scores
36	Softness & feel	1= Disagree -> 7= Agree	

Interview Question Responses - End Users I - Hi Series Napkins.

BEST WORD	No.	WORST WORD	No.	IMPORTANCE	No.	IMAGES	No.	KEY WORD	No.
Softness	16	Lack of Colour	9	Strength/not fall apart/)	15	Dinner Party	6	Softness	9
Size	14	Thin	8	Durability/not tear)		Hygenic/Clean/Hospital	4	Plain/Basic/Ordinary	8
Embossing	12	Small/size	7	Absorbant/Protection/)	12	Ordinary/Plain	4	Likeable/Pretty/Elegant/)	8
Colour/White	9	Embossing	4	Mop up messes/spills)		Fresh	3	Attractive/Nice)	
Attractive/looks good	8	Plain	4	Softness	8	Looks alright	3	Simple	4
Texture	5	Uneven Fold	3	Texture	6	Takeaway/Fastfood	3	Australian made	4
Strength/Toughness	4	Rough/Feel	3	Size	5	Cheap	3	Not Pretty/No Appeal)	4
Quality	3	Not Absorbant	2	Quality	3	Everyday Use/Functional	4	Dull/Boring)	
Absorbant	2	Price	2	Attractive/ like Mat'l	3	Dull/Boring/Common	3	Durable/Clean/Hospital/)	5
Feel	2	Too Big	2	Colour	2	Soft	2	Functional/does Job)	
Fold	2	Border	1	Pattern	1	Nicely set table	2	Size/Big	4
Australian Made	1	Look	1	Feel	1	Quality	2	Thin	3
Design	1	Too fine	1	Recycling	1	Elegant	1	Strength	2
Package	1	Quality	1	Thickness	1	Absorbant	1	Texture	2
Plain	1	Softness	1	For Dinner parties	1	Size	1	Cheap	2
Thickness	1	Breaks up in Wash	1	Folding Properties	1	Style	1	Colour/White colour	3
Useful	1							Smooth	1
								Style	1
								Good product/Feels Good	2
								Rough	2
								Absorbant	1
								Medium Quality	1
Total Responses	83		50		60		43		66

Interview Question Responses - End Users 2 - Lo Series Napkins.

BEST WORD	No.	WORST WORD	No.	IMPORTANCE	No.	IMAGES	No.	KEY WORD	No.
Softness	15	Thin	17	Strength/Durability/Not te:	17	Take away/Fast food	4	Softness	6
Size	14	Too Small	9	Softness/Care of skin	17	Dull/Boring/Plain	4	Functional/Servicable/	6
Colour	13	Lack of Colour	8	Absorbant/Protection/	16	Ordinary/Everyday/practical/	4	Practical/Suits Purpose	5
Emboss	6	Embossing	4	Size	7	Work	3	Big	4
Strength	5	Rough/Harsh/Hard	4	Does Job/Serves Purpose	5	Small	3	Small	4
Texture	5	Packaging	4	Clean/Clean & Dry	2	Soft	3	Nice	4
Attractive/Looks good	5	Too Big	3	BBQ/O'side Entertainment	2	Cheap	3	Size	3
Price	4	Uneven Fold/Untidy	3	Decor/look nice on Table	2	Dinner Party	3	Awful/Useless/Dislike	3
Plain/Simple	3	Flimsy	2	Shape/Straight edges	2	White Clouds/White	3	Perfect/Excellent/Ideal	3
Thickness/Thick	3	Uninteresting/Boring	2	Dinner Parties	1	Flowers/White China/	3	Bright/Pretty/Attractive	3
Feel/Feels nice	2	Texture	2	Everyday Use	1	Embroidered Pillowslip	2	Australian	2
Design	1	Softness	1	Feel	1	Children/Child's size	2	Plain	2
Quality	1	Holes	1	Texture	1	Cut from Toilet roll	2	Cheap/Inexpensive	2
Useable	1	Tears easily	1	Quality	1	BBQ/Picnic	2	Strength/Strong	2
Good	1	Plain	1	Price	1	Good Size	2	Basic	2
Made in Australia	1	Creases easily	1	Folding properties	1	Napkin	2	Quality	2
Disposable	1	Disposable	1	Not Sticky	1	Disposable	1	Thin	1
Print	1	Too fancy	1			Attractive	1	Durable	1
		Perfect	1			Flexible	1	Look	1
						Tears Easily	1	Touch	1
						Rough	1	White	1
						Smooth	1	Square	1
						Strength	1	O.K.	1
						Refined	1	Smooth	1
						Environment	1	Design	1
						Uneven Edges	1	Not Absorbant	1
						Nice table	1	Formal Dinner	1
						Don't want to waste it.	1	Embossed	1
						Wow	1	Napkin	1
								Double Thickness	1
Total Responses	82		68		78		53		63

Interview Question Responses - Intermediary End Users - Intermediary End User Napkins.

BEST WORD	No.	WORST WORD	No.	IMPORTANCE	No.	IMAGES	No.	KEY WORD	No.
Size	8	Easily Torn/Tears	6	Absorbant/Wipe up mess	12	Clean	3	White/White Paper	7
Quality	6	Embossing	3	Used by Mothers for Baby	7	Necessary/Customer req't	3	Soft/Softness	5
Appearance	4	Hard to Dispense	2	Softness	6	White Rectangle/White/White	3	Clean/Sanitary	4
Colour	4	Hard to Separate (Drive-thru)	2	Strength/Durability	5	Fluffy Clouds/Bubbly	2	Quality Product	3
Price	4	Creases	1	Customer Satisfaction/ Franchisee acceptance	3	Rough/Roughness	2	Useful/Effective	3
Personalised logo	3	Pattern/Lack of	1	Feel/Not Rough	3	Quality	2	Uniform/Consistent	2
Softness	3	Size of carton	1	Company Image/Advertising	2	McDonalds	2	Boring/Plain	2
Package Consistency	3	No Company Logo	1	Stock availability	2	Expense/Cost reduction	2	Not Durable/Torn napkins	2
Clean/Neat/Tidy	3	Disposal	1	Environmentally friendly	1	Food/Fast Food	2	Strength	1
Uniformity	2	Thin	1	Single serve	1	Advertising	1	Customer Service	1
Texture	2	Plain	1	Quality	1	Pattern/Lack of	1	Company Logo	1
Feel	2	Rough	1	Texture	1	Cheap (No Colour)	1	Price	1
Strength/Durability	2	Softness	1	Size	1	Disposable	1	Efficient/Practical	1
Absorbancy	2	Size	1	Dispense properly	1	Wiping Hands/ Faces	1	Great	1
Availability	2	Pack Bander Breaks	1	Wastage	1	Boring/no Colour	1	Disposable	1
Ease of Ordering	1	Not enough plies	1	Appearance	1	Napkins	1	Thin	1
Delivery	1	Price	1	Cleanliness	1	Ease of Handling	1	Availablity	1
Effectiveness	1			Not too Thin	1	Paper Scraps at dispenser	1	Napkins	1
Prefolded	1			Ease of Use	1	Napkin Dispenser	1	Texture	1
Embossing	1			Do the Job	1	Neat/Compact	1	Bubbly	1
Dispenses easily	1					Plain	1	Well Made	1
Even Folds/ Folding	1					Customer Service.	1	Advanced design	1
Smooth/Not Rough	1					The type they are	1		
Reduced Usage (New Dispenser)	1								
Functional	1								
Everybody likes them	1								
Total Responses	61		26		49		33		42

End user 1 Responses - High Quality Napkins.

MEAN & STANDARD DEVIATION

Variable Name	Sample Size	% Mean	Sample Std. Dev'n	Sample Variance	Coeff. of Variation.
RANKING OF QUALITY & CUSTOMER SERVICE					
Range	48	19	13.5	181.1	0.71
Size	48	14.1	9.4	87.6	0.66
Colour	48	17.2	10.5	111	0.61
Quality 1.	48	20.2	13.2	175.1	0.66
Price	48	25.9	13.2	175.5	0.51
RANKING OF THE TECHNICAL ASPECTS OF QUALITY					
Tissue Colour	48	14.5	11.4	129.5	0.79
Look	48	19.6	15.1	229.3	0.77
Feel	48	19.2	11.8	138.2	0.61
Emboss Quality	48	10.9	7.8	60.8	0.71
Fold Evenness	48	9.9	9	80.5	0.91
Surface Faults	48	11.1	8.6	73.2	0.77
Packet Fit	48	6.2	5.3	28.4	0.86
Packaging	48	7.7	5.3	28.3	0.69
NAPKIN EVALUATION.					
Image	48	3.42	2.26	5.1	0.66
Emboss Quality	48	3.35	1.9	3.6	0.57
Emboss Pattern	48	3.1	1.61	2.61	0.52
Edges - Napkin	48	3.83	2.27	5.16	0.59
Edges - Packet	48	3.79	2.02	4.08	0.53
Creases/Wrinkles	48	4.65	2.32	5.36	0.5
Feel	48	5.73	1.62	2.63	0.28
INTERVIEW QUESTIONS.					
Packaging Type	48	2.02	1.69	2.87	0.84
Colour of Napkin	48	3.13	2.05	4.2	0.66

Note: The Coefficient of Variation is high but with a sample size
of not less than 48, the results support the conclusions.

End user 2 Responses - Low Quality Napkins.

MEAN & STANDARD DEVIATION

Variable Name	Sample Size	% Mean	Sample Std. Dev'n	Sample Variance	Coeff. of Variation.
RANKING OF QUALITY & CUSTOMER SERVICE					
Range	49	16.6	14.3	205.6	0.86
Size	49	14	12.7	162.5	0.91
Colour	49	16.5	16.3	265.8	0.99
Quality 1.	49	23.4	14	197.3	0.6
Price	49	29.4	20.7	426.7	0.7
RANKING OF THE TECHNICAL ASPECTS OF QUALITY					
Tissue Colour	49	17.9	20.3	412	1.14
Look	49	20.4	18.6	344.4	0.91
Feel	49	18	13.9	194.5	0.78
Emboss Quality	49	9.5	14.9	221.6	1.56
Fold Evenness	49	6.5	6.4	40.6	0.98
Surface Faults	49	10.9	11.6	133.7	1.06
Packet Fit	49	6.7	6.2	38.3	0.92
Packaging	49	7.4	6.8	46.8	0.92
NAPKIN EVALUATION.					
Image	49	3.2	2	4	0.62
Emboss Quality	49	3.47	1.96	3.84	0.56
Emboss Pattern	49	3.59	2	4.08	0.56
Edges - Napkin	49	3.59	2.13	4.54	0.59
Edges - Packet	49	3.57	2.12	5	0.59
Creases/Wrinkles	49	4.65	2.42	5.86	0.52
Feel	49	5.59	1.68	2.83	0.3
INTERVIEW QUESTIONS.					
Packaging Type	49	1.92	1.72	2.95	0.9
Colour of Napkin	49	2.88	1.79	3.19	0.62

Note: The Coefficient of Variation is high but with a sample size of not less than 49, the results support the conclusions.

Intermediary Customer Responses

MEAN & STANDARD DEVIATION

Variable Name	Sample Size	% Mean	Sample Std. Dev'n	Sample Variance	Coeff. of Variation.
RANKING OF QUALITY & CUSTOMER SERVICE					
Range	30	12.9	11.4	130.3	0.89
Stock Availability	30	15.2	11.9	141.5	0.78
Delivery	30	15.2	13	169.3	0.86
Quality	30	18.9	13.2	174.9	0.7
Price	30	21	19.2	369.9	0.92
Accuracy/Reliability	30	6.9	7.1	50.7	1
Communication	30	6.3	6.5	42.4	1
RANKING OF THE TECHNICAL ASPECTS OF QUALITY					
Tissue Colour	30	9.7	8.4	70.1	0.86
Look	30	18.2	11.5	131.9	0.63
Feel	30	15.6	8	64.3	0.51
Emboss Quality	30	9.6	7.8	61.4	0.82
Fold Evenness	30	13.4	7.9	62.4	0.59
Surface Faults	30	11.8	10.3	105.5	0.87
Packet Fit	30	9.6	10.3	106.3	1.1
Packaging	30	5.4	6	35.4	1.1
NAPKIN EVALUATION.					
Image	30	3.23	1.85	3.43	0.57
Emboss Quality	30	4.5	1.66	2.74	0.37
Emboss Pattern	30	4.37	2.13	4.52	0.49
Edges - Napkin	30	4.8	1.77	3.13	0.37
Edges - Packet	30	4.97	1.81	3.27	0.36
Creases/Wrinkles	30	5.43	1.87	3.49	0.34
Feel	30	5.77	1.38	1.91	0.24
DELIVERY PERFORMANCE.					
Delivery - Time/Date	30	6.43	1.14	1.29	0.18
Stock Availability	30	6.73	0.69	0.48	0.1
48 hour delivery	30	5.5	1.48	2.19	0.27
72 Hour Delivery	30	4.5	1.72	2.95	0.38
Delivery Promises	30	4.9	2.25	5.06	0.46
Partial deliveries	30	2.8	1.97	3.89	0.7
INTERVIEW QUESTIONS.					
Packaging Type	30	2.2	1.77	3.13	0.8
Colour of Napkin	29	3.55	1.38	1.9	0.39
Elapsed Time	24	70	30.8	947	0.44

Note: The Coefficient of Variation is high but with a sample size not less than 24, the results support the conclusions.
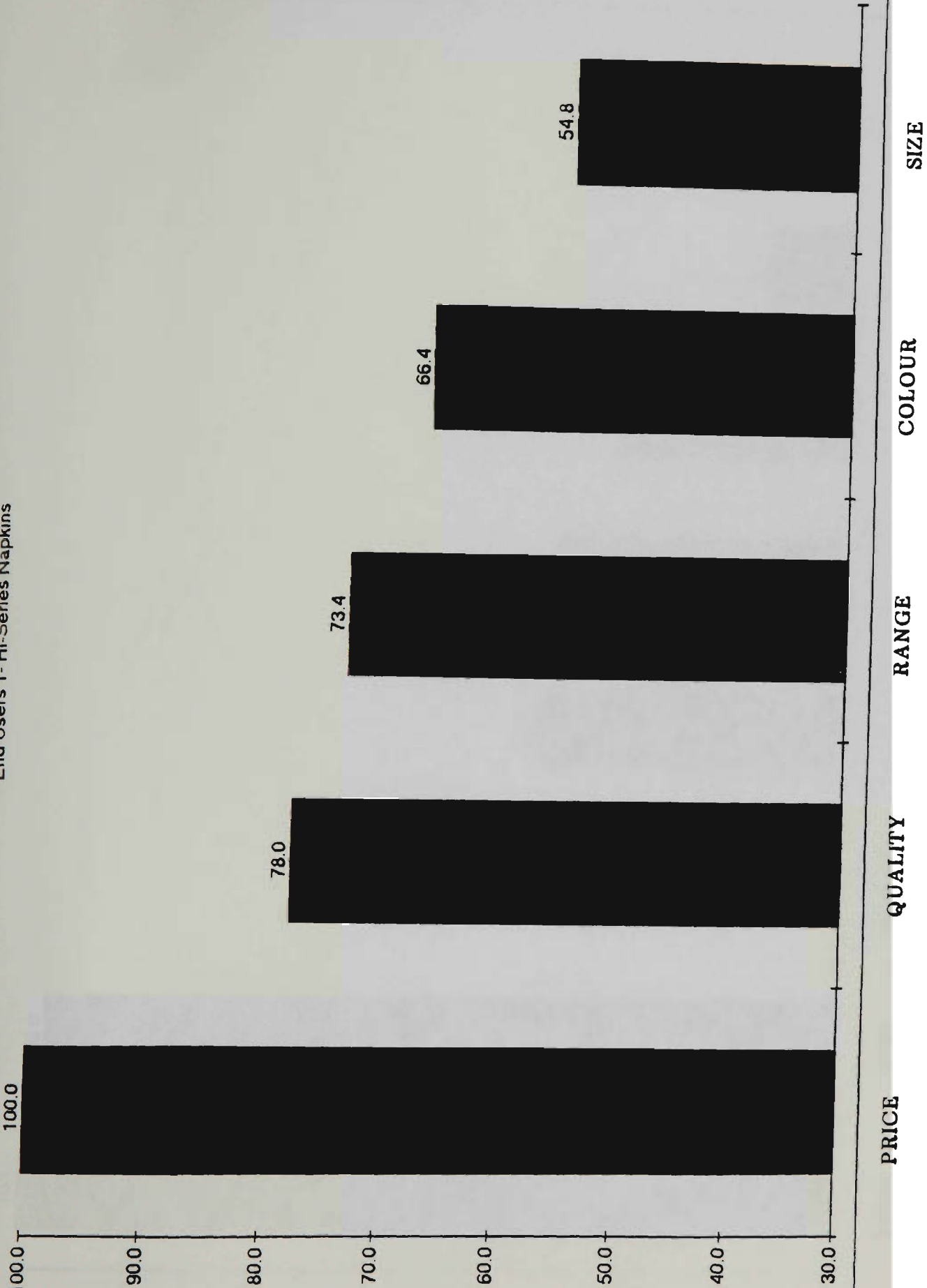
Total population

MEAN & STANDARD DEVIATION

Variable Name	Sample Size	Mean	Sample Std. Dev'n	Sample Variance	Coeff. of Variation.
RANKING OF QUALITY & CUSTOMER SERVICE					
Range	97	17.8	13.9	192.9	0.78
Size	97	14.1	11.1	124.3	0.79
Colour	97	16.9	13.7	187.4	0.81
Quality 1.	97	21.8	13.7	186.9	0.63
Price	97	27.7	17.4	302.3	0.63
RANKING OF THE TECHNICAL ASPECTS OF QUALITY					
Tissue Colour	127	14.7	15.2	231.2	1.04
Look	127	19.4	15.5	241.3	0.8
Feel	127	17.9	11.9	142.3	0.67
Emboss Quality	127	10.1	11	121.7	1.1
Fold Evenness	127	9.4	8.2	66.9	0.87
Surface Faults	127	11.2	10.1	102.7	0.91
Packet Fit	127	7.2	7.2	51.5	1
Packaging	127	7.7	9.4	89	1.22
NAPKIN EVALUATION.					
Image	127	3.29	2.05	4.22	0.62
Emboss Quality	127	3.67	1.91	3.65	0.52
Emboss Pattern	127	3.58	1.95	3.82	0.55
Edges - Napkin	127	3.97	2.15	4.6	0.54
Edges - Packet	127	3.98	2.07	4.3	0.52
Creases/Wrinkles	127	4.84	2.27	5.14	0.47
Feel	127	5.68	1.58	2.51	0.28
INTERVIEW QUESTIONS.					
Packaging Type	127	1.99	1.69	2.87	0.85
Colour of Napkin	126	3.13	1.82	3.3	0.58

Note: The Coefficient of Variation is high but with a sample size
of not less than 97, the results support the conclusions.

Ranking of Quality & Customer Service
End Users 1 - Hi-Series Napkins

PERCENT

PRICE 100.0
QUALITY 78.0
RANGE 73.4
COLOUR 66.4
SIZE 54.8

Technical aspects of Quality
End Users 1- Hi-Series napkins

Category	Percent
LOOK	100
FEEL	98.0
TISSUE COLOUR	74.0
SURFACE FAULTS	56.6
EMBOSS QUALITY	55.6
FOLD EVENNESS	50.5
PACKAGING	38.1
PACKET FIT	31.6

PERCENT
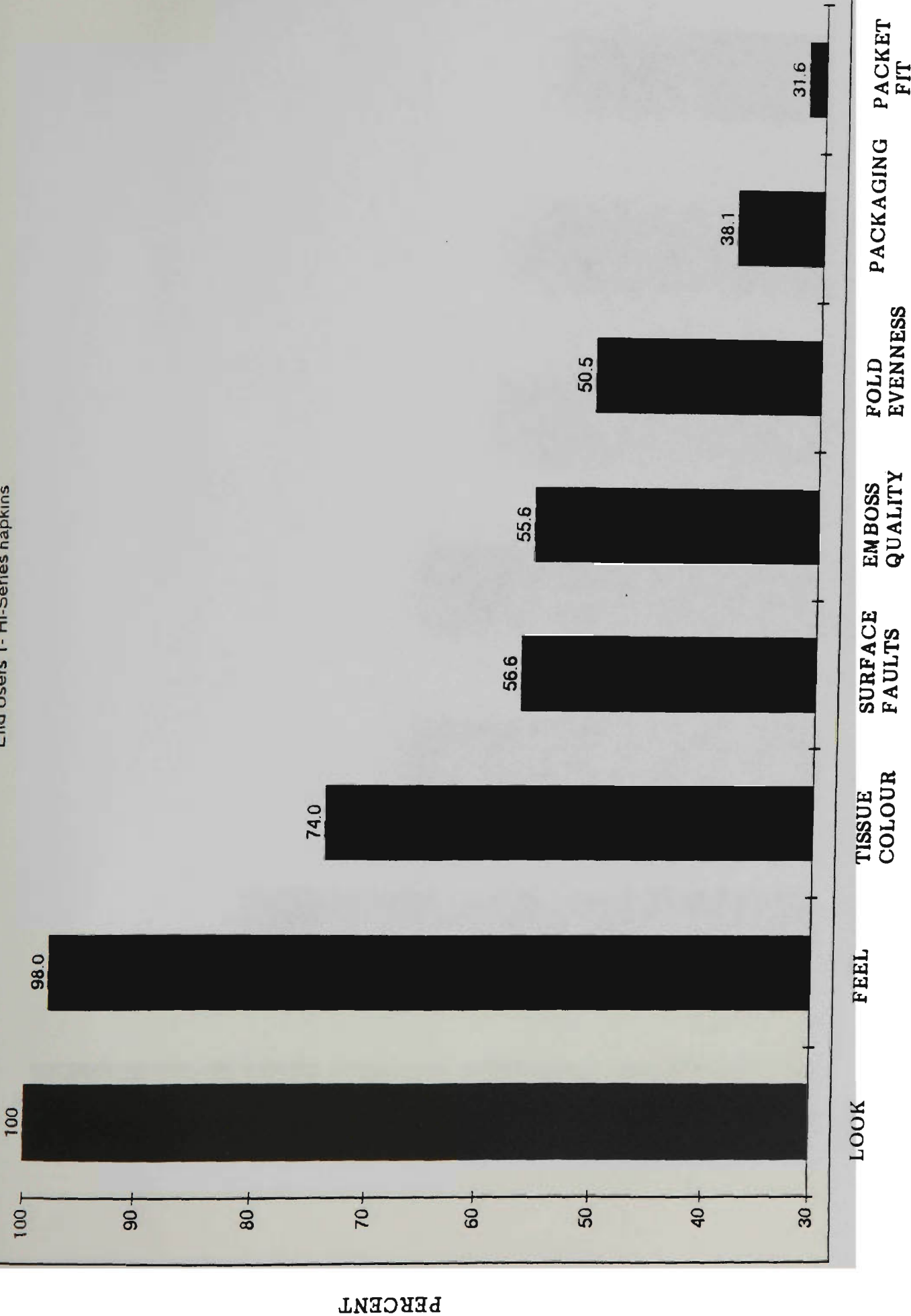
Napkin Evaluation.
End users 1 - Hi-Series napkins.

Category	Percent
FEEL	100
CREASING	81.3
EDGES – NAPKIN	66.8
EDGES – PACKET	66.1
IMAGE	59.7
EMBOSS QUALITY	58.5
EMBOSS PATTERN	54.1
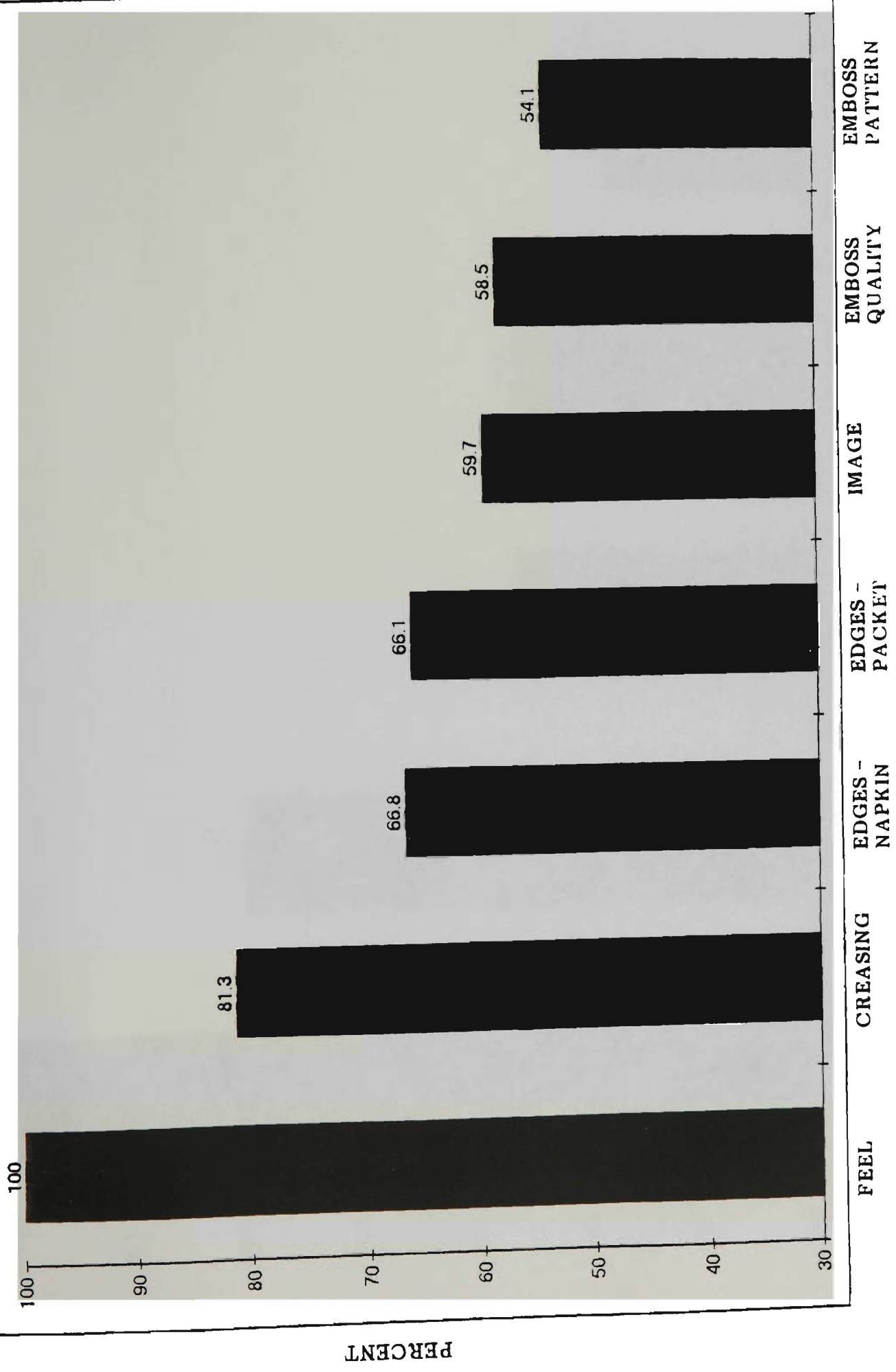
Ranking of Quality & Customer Service.
End Users 2 - Lo-Series Napkins.

PERCENT %

Category	Percent
PRICE	100.0
QUALITY	79.6
RANGE	56.5
COLOUR	56.1
SIZE	47.6

Technical Aspects of Quality
End Users 2 - Lo-Series Napkins.

Category	Percent (%)
LOOK	100
FEEL	88.2
TISSUE COLOUR	87.7
SURFACE FAULTS	53.4
EMBOSS QUALITY	46.6
PACKAGING	36.8
PACKET FIT	32.8
FOLD EVENNESS	31.9
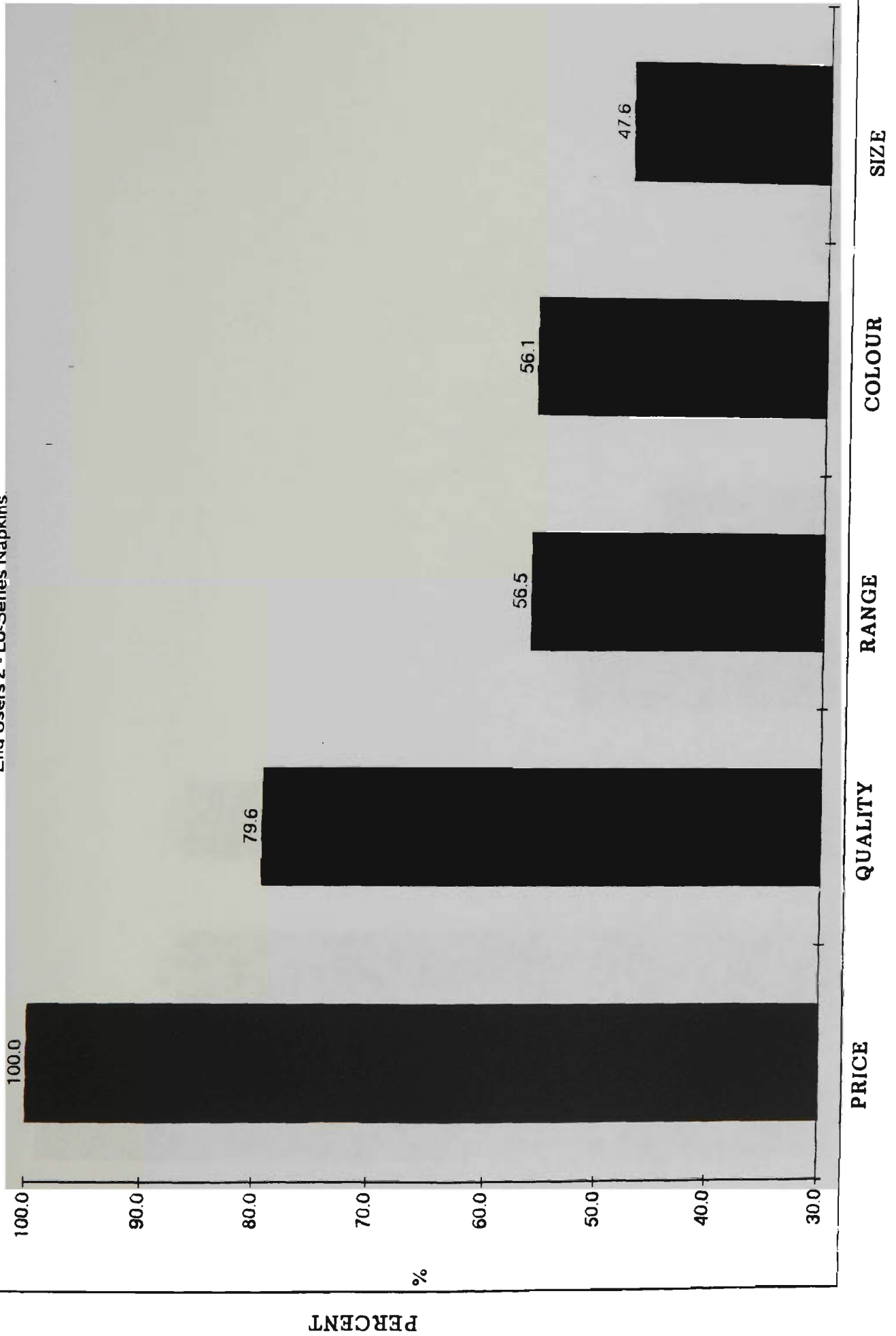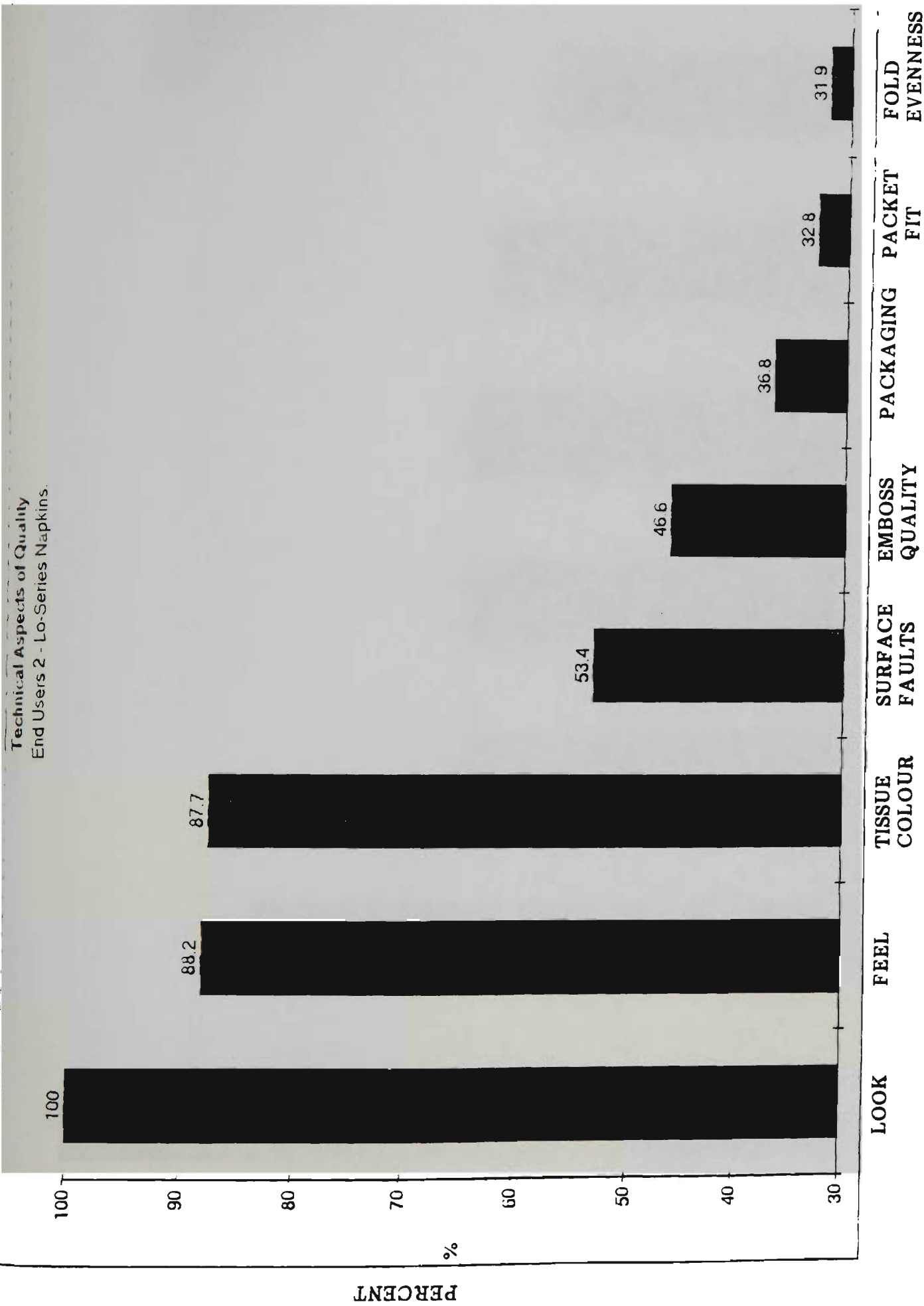
Napkin Evaluation
End Users 2 - Lo-Series Napkins

Category	Percent
FEEL	100
CREASES/WRINKLES	83.2
EMBOSS PATTERN	64.2
EDGES – NAPKIN	64.2
EDGES – PACKET	63.9
EMBOSS QUALITY	62.1
IMAGE	57.2

PERCENT

Ranking of Quality & Customer Service
Corporate End Users

PRICE 100.0
QUALITY 90.0
DELIVERY 72.4
STOCK AVAILABILITY 72.2
PRODUCT RANGE 61.4
INFORMATION 32.9
COMMUNICATION 30.0

PERCENT
%

Technical Aspects of Quality.
Corporate End Users

Napkin Evaluation.
Corporate Endusers.

Attribute	%
FEEL	100
CREASES/WRINKLES	94.3
EDGES – PACKET	86.3
EDGES – NAPKIN	83.3
EMBOSS QUALITY	78.1
EMBOSS PATTERN	75.9
IMAGE	56.1

PERCENT

Delivery Performance.
Corporate end users

PERCENT

%

	Value
STOCK AVAILABILITY	100
DELIVERY ON DATE/TIME	95.5
DELIVERY IN 48 HRS	81.7
DELIVERY PROMISES	72.8
DELIVERY IN 72 HRS	66.9
PARTIAL DELIVERIES	41.6

t-TEST Calculations

	All Responses		Enduser 1 Hi-Series		Enduser 2 Lo-Series		Intermediary		End User 1 vs Enduser 2 t-TEST	Intermed'y vs End User 1 t-TEST	Intermed'y vs Enduser 2 t-TEST
	Mean	Std Dev'n	Mean	Std Dev'n	Mean	Std Dev'n	Mean	Std Dev'n			
Range	17.804	13.888	19.000	13.458	16.633	14.339	13.258	11.434	0.8386	-2.0137	-1.1538
Size	14.082	11.147	14.188	9.372	13.980	12.747			0.0917		
Colour	16.866	13.688	17.208	10.535	16.531	16.305			0.2436		
Quality (1)	21.794	13.672	20.188	13.232	23.367	14.046	19.065	13.048	-1.1479	-0.3678	-1.3814
Price	27.680	17.387	25.938	13.250	29.388	20.657	20.710	18.979	-0.9812	-1.3209	-1.9067
Tissue	14.661	15.207	14.500	11.381	17.857	20.298	9.700	8.371	-1.0073	-2.1392	-2.4886
Look	19.441	15.534	19.625	15.144	20.408	18.557	18.233	11.485	-0.2279	-0.4595	-0.6434
Feel	17.874	11.930	19.208	11.755	17.959	13.945	15.600	8.020	0.4774	-1.6101	-0.9542
Emboss	10.071	11.030	10.917	7.800	9.531	14.886	9.600	7.833	0.5760	-0.7234	0.0271
Fold	9.409	8.177	9.875	8.970	6.536	6.371	13.367	7.898	2.1098	1.8018	4.0058
Faults	11.197	10.134	11.104	8.558	10.918	11.567	11.800	10.274	0.0901	0.3098	0.3527
Packet Fit	7.181	7.173	6.188	5.330	6.694	6.185	9.567	10.308	-0.4322	1.6620	1.3818
Packaging	7.693	9.434	7.708	5.323	7.449	6.838	5.400	5.952	0.2087	-1.7345	-1.4024
Image	3.291	2.055	3.417	2.258	3.204	2.000	3.233	1.851	0.4905	-0.3905	0.0661
Emboss (2)	3.669	1.911	3.354	1.896	3.469	1.959	4.500	1.656	-0.2944	2.8100	2.5018
Emboss Pattern	3.583	1.954	3.102	1.614	3.592	2.020	4.367	2.125	-1.3216	2.7951	1.6024
Edges of Napkin	3.969	2.145	3.833	2.272	3.592	2.130	4.800	1.769	0.5397	2.0999	2.7221
Edges in Pkt	3.984	2.074	3.792	2.021	3.571	2.123	4.967	1.810	0.5234	2.6661	3.1109
Creases	4.841	2.268	4.660	2.315	4.653	2.420	5.433	1.870	0.0135	1.6198	1.6061
Feel	5.677	1.583	5.729	1.621	5.592	1.682	5.767	1.382	0.4095	0.1090	0.5018
Pkg'g Ranking	1.992	1.693	2.021	1.695	1.918	1.718	2.200	1.769	0.2957	0.4422	0.6942
Colour Ranking	3.127	1.815	3.125	2.049	2.878	1.787	3.552	1.378	0.6334	1.0991	1.8810
No. Responses	127		48		49		30				