An Investigation of Colour Forecasting.

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Abstract.
Abstract

The colour forecasting process is one of great complexity, and very much an intuitive one. As yet, little information exists about its methodology and even less in depth information is currently available, even though the process is very much considered to be a major driving force of the fashion and textile industry by those involved.

The recognition of the need for more substantial understanding and knowledge of the colour forecasting process initiated this investigation. Previously acquired forethought, from other research projects undertaken, regarding the possible involvement of consumer colour preference, or consumer desire data and its benefit to the current colour forecasting system, provided a pathway for this study. A combination of secondary research and primary investigation exercises and testing methods were used to further understand the current process.

The study began with an investigation into the historical background of the fashion and textile industry, from the onset of the industrial revolution until present day. The collation and analysis of the activities during this period highlighted the driving forces of fashion throughout, and identified key aspects that initiated the need for forecasting as early as circa 1825. The dateline chart of information produced on CD-ROM, which accompanies this thesis was developed from the initial investigation and demonstrates the evolution of the need for forecasting and pinpoints the periods in time when this specialist sector established.

Through a review and evaluation of the current literature available, the forecasters were identified and also the process and tools that they use. After breaking down the process into its individual components for discussion, the process was then considered holistically through the application of soft systems methodology. This methodology was used to develop a conceptual model of the current colour forecasting process and for the initial development of a proposed improvement to the system. Both models were tested for validation within the industry and then refined. An investigation to assess the teaching approaches of colour forecasting on two degree courses; one fashion related, the other textile related, was undertaken, also students colour knowledge and their understanding of the colour forecasting process was observed and evaluated.

The aim of the study was to demystify and clarify the colour forecasting process, though there was never any intention to dismiss the part that intuition and inspiration play.
I would like to thank the following for their time during the preparation and execution of this research project.

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Finally, many thanks to my family, Tom, Jamie and Charlotte for their endurance of mood swings, late evening meals and lack of normal family life.

*The significant problems we face today cannot be solved at the same level of thinking we were at when we created them.*

Albert Einstein.
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1.

*Introduction.*
The aim of the study was to investigate the colour forecasting process to provide a better understanding of the methodology and methods used and, through the development of systems models to attempt to develop a potential improvement to this system.

The main objectives of the study were:

- To better understand the current colour forecasting process.
- To develop an understanding of how, when and why the need for colour and fashion forecasting came about, and how the current colour forecasting process evolved.
- To establish who the forecasters are, how they develop colour stories, and how this information is used by the industry.
- To investigate the methodologies hidden behind the mystique of the colour forecasting profession.
- To investigate other methodologies that could be applied to the current process of colour forecasting.
- To develop models of the current system and of a proposed improved system.
- To test developed models to assess their validity.
- To develop an understanding of consumer preference data and its potential benefit to the current system.

Colour forecasting is a fundamental part of a collective process known as fashion forecasting or trend prediction, where individuals or teams attempt to accurately forecast the colours, fabrics and styles of fashionable garments and accessories that consumers will purchase in the near future, approximately two years ahead.

The process of colour forecasting is basically one of collecting, evaluating, analysing and interpreting data to anticipate a consumer desirable range of colours using a strong element of intuition, inspiration and creativity.
An on-going dichotomy exists which revolves around opinions as to whether or not the forecaster predicts trends or merely creates them. Either way, a process has evolved over a period of time, which has in more recent decades, become increasingly complex. So much so that the secondary resource material readily available to the fashion student rarely offers more than a brief outline of the concept, the tools and the basic methodology involved in the colour and fashion forecasting process.

The process of colour and fashion forecasting has become a more integral part of the job roles of many within the industry. Personnel such as designers, range developers, sourcing personnel, buyers and merchandisers, and especially those who specialise in trend prediction for the purpose of selling their prediction packages to the industry, use the current forecasting system. It is becoming increasingly more important to understand this process with more clarity, by those currently using the system in order to improve the process, and for the new comer to forecasting.

While fashion forecasting incorporates all aspects of the design of garments and accessories, colour is reputed to be of high consideration to the consumer when making a purchasing decision. It is therefore considered that the colour forecasting process is a worth while subject to be investigated and further understood in its own right.

Colour forecasting is considered to be a specialist sector activity. This specialist sector is a service that makes use of the colour forecasting process. The information is compiled into trend prediction packages and sold to the fashion and textile industry. Personnel within the industry use this information for direction, suggestion and as a source of inspiration. They then use the same process or a very similar one to develop their own company's colour range. This research concentrates on the process applied to the development of colour stories or ranges from the specialist sector throughout the various sectors of the fashion and textile industry.

Manufacturers use the prediction packages as one source of data used in conjunction with other data collected. They then apply the colour forecasting process, or a version of it, to formulate their own seasonal colour ranges for their products to sell to the retail sector. The retailers may also subscribe to the colour forecasting services, purchasing the prediction packages to use as a source of inspiration, to assist them to formulate their colour ranges.
Consumers use a process of decision making when selecting a garment to purchase. Colour preferences are an extremely influential aspect that the consumer takes into consideration when choosing to purchase a fashion item. Successful sales reflect the effectiveness of the colour decisions that were made throughout the industry.

In order to understand the current colour forecasting process, the research began with an investigation of the historical background of fashion forecasting and the driving forces of fashion, from the beginning of the industrial revolution until the end of the second millennium, and this is discussed in the next chapter.

This preliminary study into the subject area highlighted key aspects that had, when combined, greatly influenced the initiation and development of the colour forecasting process. These included direct and indirect influences from society, the economy, and from technical developments within related industries. From the three hundred year period studied, five key aspects were identified and used for the basic structure of the dateline chart that accompanies this thesis on CD-ROM.

Relevant information was recorded on a dateline chart for ease of identification of the driving forces of fashion, when and where forecasting evolved and developed, also how and when consumer demand became a more influential factor on fashion.

The concept of forecasting came about through developments and the growth of the fashion and textile industry, to enable manufacturers to produce end products that would create sales on the high street. By the latter half of the twentieth century, a greater need had developed for more accurate information to be more readily available to all sectors of the industry, from fibre, yarn and fabric manufacturers, through to the garment manufacturers and retailers, collectively known as the fashion and textile industry. As the industry as a whole became more extensive and global, and consumer lifestyles became more varied, so the process of collecting the necessary data for forecasting became more diverse and complex.

Seasonal colours' have become a powerful driving force of fashion today. The colour forecasting service was established through a perceived lack of communication, between the primary market manufacturers and the consumer, and the recognition of the increasing complexities of forecasting with advances in marketing strategies.
The service was established to deal with the problem of anticipating the colour demand/preferences of the consumer prior to the industry's production time plan (lead time), thus unburdening manufacturers of this process. While the concept of forecasting was originally for the primary market sector, selling information to the secondary and tertiary market sectors increased the revenue for the service sector and influenced a stronger consensus for the conviction of the colour stories. Whatever colours are finally predicted for a season and however these colours are promoted throughout the industry to the consumer, it is the decision to purchase made by the consumer that determines whether or not the predictions were accurate or valid. Marketing may invariably influence the consumers' decision to feel the need to make a purchase, however, the colour choice is still the decision of the consumer, based upon their personal preferences.

A review of the current literature published on the subject was conducted in chapter 3. There would currently appear to be a lack of information readily available that offers any in depth understanding of the complexities of this process. The value of this literature was assessed to establish the level of the body of knowledge of the process. There is no doubt that colour forecasting is considered to be an essential requirement to the fashion and textile industry's survival and profitability. Though the level of knowledge about the process suggested that it is little understood and that this factor creates a monopoly for the specialist forecasting sector.

Chapter 3 also discussed and evaluated the general terminology used by fashion and colour forecasters and the problems encountered by the poor communication of colour. Many of the tools of forecasting were identified and their application and usefulness evaluated. Overall, the current literature only identified the tools used, and did not attempt to discuss how they were applied, or how they effect the development of the colour stories, or colour ranges.

As the information currently available can be considered to be somewhat evasive and ambiguous, consideration was given to the student of fashion and textiles related subjects. Many graduates will invariably be involved in the use of the colour forecasting process, either in the specialist forecasting sector or incorporated into their job role within the fashion and textile industry. The new comer, it would appear, would be expected to learn about the process through experience. This puts into question how long it would be before they were fully competent in using the system. Also, it should be considered that as the process is little understood, the effective teaching of the subject to students is affected.
The terminology of fashion and colour forecasting was discussed in Chapter 3, likewise, in chapter 4, the basic terminology of colour was discussed for the reader's benefit. Also it was considered to be a useful exercise, at this point, to try to evaluate the level of colour knowledge amongst students studying fashion and textile related degrees.

In chapter 5, various methodologies were discussed and evaluated for their usefulness as a tool to further understand the process of colour forecasting. Chapter 3 highlighted the extensive use of soft or subjective forecasting tools, particularly intuition. Intuition was further discussed in Chapter 5 and its importance in the colour forecasting process is supported, though it is recognised that there is a need for greater clarity of this process. The methodologies investigated were applied to the development of the colour stories and discussed in chapter 6. Degree students were used in various exercises to try to assess the effectiveness of the methodologies and to assess the methodology that individuals and teams used having little or no knowledge of how the colour forecasting process works. Teaching modules were also assessed to establish the level of knowledge that students understand about the colour forecasting process. Chapter 7 investigated the effectiveness of soft systems methodology and was used to model the current colour forecasting process and that of a proposed improvement to the system. Both of these models were tested within the fashion and textile industry, and the constructive critical feedback was used to make refinements to the models.

Through the research project, each component of the colour forecasting process was identified and discussed for further understanding of the methodology, and then the process was investigated holistically. Consumer research was also undertaken to establish the effectiveness of using consumer research data on colour choices. As the fashion and textile industry is currently changing, retailers are now showing evidence of dictating their observations and evaluations of the needs of the consumer back to the manufacturers, altering the change of colour direction from the manufacturer to the retailers. Developments in the concept of mass customisation would suggest that the current forecasting process is not as effective or successful in its results as the industry would like. As the customer has to some extent, and possibly always will be, a major driving force of fashion, their preferences are a key aspect for consideration.

Not only is it considered to be imperative to have a better understanding of the process of colour forecasting, for effective teaching of the subject area, but also to enable visionaries to suggest, test and implement changes to the current system for the optimum benefit of all concerned.
2.

Fashion Forecasting
&
The Driving Forces of Fashion.

1700 - 2000
2.

Fashion forecasting and the driving forces of fashion

1700 - 2000.

The purpose of the initial background research of the fashion and textile industry over the past three centuries was to establish when forecasting colour and fashion direction became a necessity to the industry and why this need came about. This was achieved through the identification of the driving forces of fashion past and present, to better understand how and why the colour forecasting process was initiated and developed to its present day state.

The studied time period, 1700 to 2000 was deliberately selected in order to follow fashion directions from the period just prior to the industrial revolution, during the revolution and through to the present day.

Many text books are available giving accurate accounts of the technical developments from the industrial revolution onwards in the textile and garment production related industries. Likewise, much information is readily available portraying the history of fashion. This section of research focuses upon collating many of these elements together in such a manner as to identify the actual driving forces of fashion and the importance of forecasting fashion direction and its frivolities. This was achieved by categorising the inventions and developments of importance in the textile and garment production industry. Other information taken into account included the colours, fabrics and styles available; influential people such as designers and public figures; and advances in the retail and marketing sectors. This information when collated on a dateline chart provided a snapshot of each period in time that shows what developments were happening in each sector at the same time. This aided in the identification of the driving forces of fashion throughout the three hundred year period. The dateline chart was instrumental in rationalising the information and the development of this chapter. The original dateline chart developed consists of ninety pages of information, this was considered to large to be included in the thesis in its original format, and accompanies the thesis in CD-ROM format. A synopsis of the dateline is included prior to the summary at the end of this chapter, figure 1, pages 25 to 33.
2.1 The eighteenth century.

The fashion student could be led to believe that the driving force of fashion was initially that of the development of the cotton industry during the 1730's, with the development of Kay's flying shuttle, followed by cotton spinning machinery. By starting the research at the beginning of the eighteenth century however, it is realised that the first spinning machinery developments were actually for the spinning of silk.

At this time silk and cotton fabrics were imported into Britain, and were only afforded by the wealthy. Silk had the obvious aesthetic advantage of its luxurious appearance, but also has other characteristics such as good handle and drapability and excellent dyeing capabilities, enabling brighter colours to be produced that were not achievable on woollen fabrics. This made silk fabrics much sought after by the wealthier classes. The masses could barely afford the cheap wool fabrics that were increasingly available.

2.1.1 Manufacturing.

The ability to spin silk in Britain reduced the costs of silk fabric production. Quite possibly the realisation of this inspired others to develop spinning methods in Britain for cotton. It may even have been forethought that the cheap production of cotton would make these fabrics affordable not only to the wealthier classes of society, but also to the mass population. Therefore increasing the volume of production for the manufacturer.

The spinning industry improved the speed and quality of yarn production in Britain, thus making yarns abundantly available. As the weaving entrepreneurs developed the weaving loom which increased the rate of fabric production, the textile industry began to develop (Ellacott, 1956). Knitting frames were first invented during the sixteenth century, but were little developed until now. Improvements to these machines boosted the hosiery trade.

Cotton fabrics were easier to wash than wool, as the fabrics could be boiled and therefore considered to be more healthy than wool fabrics. This helped to increase the demand for cotton fabrics and improvements in the production methods and machinery heightened the availability.
2.1.2 The driving force of fashion.

The opening of more and more spinning mills and fabric manufacturing units produced an era of businessmen. As more wealth circulated, invariably from the exploitation of the labour force, class division became ever more apparent. Rightly or wrongly, the wealthy began to take it upon themselves to set the unwritten, but much recognised and adhered to rules of social status and acceptable behaviour. Women's dress (Wives & Daughters) became the symbol of a man's wealth and social position. As fabrics became cheaper to produce and more readily available to the mass population the gap between classes narrowed as far as appearance through fashion was concerned. Therefore style, cut and fit became more important to high fashion (Rouse, 1989), and skilled labour developed in this small manufacturing sector. Styles varied much during this century, from the more practical styles of the early decades to wide gowns utilizing hoops, then back to the slimmer styles of the latter decades.

2.1.3 Rose Bertin.

The first recognised designer of this time was Rose Bertin. She opened her salon in Paris in 1773, closing some twenty years later. She gained a reputation for having a rare talent for colour, style and fit and later became dressmaker to Queen Marie Antoinette (Lehnert, 1999).

2.1.4 Garment production.

By the end of the eighteenth century the garment manufacturing process within the fashion industry came into being with the development of the sewing machine. As the developments in the mechanisation of fibre preparation, and yarn and fabric production had accelerated, so the garment manufacturing process was destined to follow suit. At this time also, new magazine publications were becoming available specifically for women. These magazines often included fashion notes, new colour illustrations of the day's fashion and tips for ladies to share with their dress makers.
2.2 The early nineteenth century.

By the 1800’s the manufacturing industry was more concerned with improving the machinery and the production techniques as opposed to further new inventions. The factory system was also by now well established, taking production away from the cottage industry and being sited within large premises.

2.2.1 The driving force of fashion.

By the beginning of the nineteenth century social class and status had established itself firmly. Quite possibly the division of wealth so great by now between the classes had shifted the efforts of division away from the middle and lower classes, to the upper class. Many fashion history books tell of how George Byran ‘Beau’ Brummell relished in out doing his once good friend, Prince Regent in terms of fashion and image, which actually inspired a certain setting of high quality standards in British tailoring at the time (Coleman, 1989). This followed through into the upper class circles of socialites, determined to out do their acquaintances and business associates by displaying their wealth. Of course, the frivolity of women at this time provided fashion with its most powerful driving force to date. The development of the textile industry now simply served as a support to the extravagances of fashion to come.

To assist the display of wealth, social events became important. Fashion history books suggest that a new gown would have been necessary for each occasion and that the same gown could not be seen twice. Second hand clothing, hand me downs, were passed down through the classes, from the original wearer, to their maids and eventually finding their way to the lower classes. This would again inspire a need to have a more frequent change in fashion to separate the highly fashionable, up-to-date wealthy man’s wife from the lower classes out-of-date fashions.

Heavier plush fabrics and velvets were now available to the wealthier classes, but fabrics alone could no longer distinguish between the classes, as a wider variety of fabrics were increasingly affordable and readily available to the masses. This allowed them to copy the fashions of high society, which were by now very much published in a wider selection of women’s magazines. These too, would find their way down to the lower classes as old copies were handed down, charitably no doubt.
2.2.2 Early Fashion Forecasting

Circa 1825, some British manufacturers had visited the USA and were much inspired by lightweight wool blend fabrics produced there for outerwear. This is quite possibly the earliest indication of a need for forecasting fashion direction by the manufacturers and evidence of sourcing inspiration. This method of inspiration is still a part of the modern day forecasting process.

As early as 1828, it was reported that a fashion style was promoted in *La Bella Assemblee* that did not become a popular feature of fashion until a decade later. Fashion changes were slow at this time (Bradfield, 1985).

2.2.3 The mid nineteenth century.

By the mid nineteenth century further developments were slowly taking place in all areas of the manufacturing sector, to further improve production rate and quality. The invention of the latch needle in 1849 for the knitting frame was instrumental in the revolution of the knitting industry. The bespoke industry that supplied the wealthier classes was also fast growing and establishing as more wealth increasingly became available.

2.2.4 Nineteenth century fashion designers.

In 1842, Redfern opened his tailoring business in Paris, followed by Henry Creed in 1850 and Worth, in 1858. Paris quite possibly became the early fashion centre due to the excellent silk industry established in Lyon, as silk was still the most important high fashion fabric (Baudot, 1999).

Worth was possibly the first designer to have a great influence upon the fashion world, though this is reputed to be more likely due to his astute business strategies as opposed to his talent as a designer.
Now that fashions were more readily available and affordable to the masses, they were freely disseminated in magazines along with garment production notes, making home made fashions more possible. The second hand clothing trade recycled high fashion garments, making them easier to obtain by the lower classes. The only way forward for class distinction was through style, cut and fit. Worth exploited the frivolity of the wealthy woman with new concepts in marketing methods. He introduced the concept of clients going to him, instead of the designer going to the client's home. His wife became the first live model displaying his works and he commonly turned ladies away from his establishment, refusing to design for them, which served to make his designs exclusive and even more sought after. No doubt he charged exorbitant fees for his professional services. (Coleman, 1989)

2.2.5 Department stores and ready to wear clothing.

By the mid nineteenth century department stores were becoming a common feature of major towns and cities. They played a fundamental part in the dissemination of fashion. Improvements to the sewing machine and its increased use in the industry encouraged the ready to wear industry to quickly develop, particularly in the USA where a ready to wear clothing industry had been established a few decades previously, primarily without the use of the sewing machine.

Department stores displayed part-made garments that were completed bespoke for the customer, within the stores workshop, on demand. (Callan, 1998)

2.2.6 Colour.

In 1862, an international exhibition was held in London showing fabrics of the new colours now obtainable as developments in the dyeing industry accelerated since Perkin's discovery of synthetic dyes, in the mid 1850's. Fibre preparation and yarn and fabric production development had by now slowed down, with more emphasis on improving existing methods.
2.2.7 Garment production.

As the sewing machine became more commonly used in the clothing industry, demand from the wealthy classes forced high fashion styles to become more intricate. This gave hand made bespoke the cutting edge over the fast growing ready to wear industry, which was increasingly popular for the lower classes, even though the quality was not very high. (Godfrey, 1982)

Paper patterns were also by now readily available through fashion magazines and mail order operations. Butterick and McCall's were well established by now in Britain as well as in the USA. Other influences came from the entertainment world with actresses such as Lillie Langtry, who promoted the designs of Redfern.

2.2.8 Man made fibre development.

The two fashion fabric industries, silk and cotton both suffered set backs in the mid nineteenth century. Silk, by the disease of the silk worms in France and cotton, by the American civil war 1861 to 1865. These events may have fuelled inspiration for synthetic fibres, for the first cellulose acetate was developed as early as 1866. By 1869, cellulose acetate yarns and fabrics were being produced in Germany. (Yarwood, 1992)

2.3 The late nineteenth century.

Doucet, another important nineteenth century designer, opened his house in 1875. Couture houses were popular establishments for actresses, royalty, the aristocracy and other wealthy socialites to frequent. (Callan, 1998)

The Sports boom of the 1880's created a new direction for the knitwear industry. Until now much of the knit fabrics produced by machine were for the hosiery industry. Recent advances in the automation of knitting frames and patterning devices allowed the frames to be used to meet the increasing demand for knitwear.
During the remainder of the nineteenth century, many more fashion houses opened in Paris and London. Mme Paquin, was another designer who like Worth developed and utilised early techniques for the effective marketing of fashion. She opened her Paris house in 1891, and is reputed to have been the first female fashion designer of any particular importance. Like Worth, this is likely to be attributed to her business astuteness rather than her actual design talent. (Carter, 1980)

Developments in the dyeing and finishing industry were assisted and demonstrated through international exhibitions, where new colours were displayed. As the sewing machine became more widely used by the garment production sector, the need for more intricate style to distinguish the upper classes became more evident in bespoke garments.

By the end of the nineteenth century, fashion magazines were still a very important vehicle for the dissemination of high fashion and became important for suggesting future fashion directions. The department store increased its importance in making fashions more readily available to many classes and the production side continued to improve upon its processes. Paris had become an important place for manufacturers to visit for the purchase of garments, or models, as they were called, to copy and sell.

2.4 The early twentieth century.

By the turn of the twentieth century, social class behaviour began to relax slowly. After the death of Queen Victoria in 1901, Britain began to shed its mourning dress and the associated somber colours which had dominated for some forty years since the death of Prince Albert.

2.4.1 Technical developments.

Much research was now undertaken in the man made fibre field. Originally these fibres were designed to imitate silk, but later they became more important in their own right with their own special characteristic properties. Synthetic dyeing processes were well developed by now. Overlocking machines assisted the cut and sew process for knitwear fabrics, which assisted increased productivity.
2.4.2 Fashion dissemination.

Photography assisted the dissemination of fashion in magazines and other paper based materials, such as newspapers and mail order brochures. Holiday travel became an important pastime for the wealthy. Fashion dissemination was possible now through post cards and cigarette cards. The Gibson Girl, who featured on many of the collectable cigarette cards, became an advertiser of fashion. Couture houses began to sell ideas of fashion to the ready to wear industry, increasing their importance as a source of inspiration.

2.4.3 The ready to wear industry.

Innovative manufacturers of ready to wear garments began to push the frontiers of fashion forward by looking for inspiration from the couture ranges. This encouraged improvements in quality and the finding of more profitable marketing avenues. While it is true that at any one time, the consumer can only make a purchase selection from what is made available at that time, it does not automatically follow that what is available will be desired by the consumer. As the ready to wear retail sector grew, and lifestyles became more diverse, it became more difficult for the manufacturers to read and meet the needs/ desires of the consumer.

2.4.4 Early twentieth century designers.

More designers opened their houses during the early years of the twentieth century, including Poiret in 1903 and Chanel in 1915. These two designers were much copied and succeeded in making their designs readily available to more than just the wealthy upper classes. Chanel demonstrated her business talents by using synthetic fibres within her couture designs, making them more affordable to a wider audience without discrediting her design talent. World War I interrupted fashion and its associated industries for a short period of time, 1914 to 1918. (Callan, 1998)
2.4.5 The Colour Association of the United States (CAUS)

In 1915, The Colour Association of the United States (CAUS) became involved in colour forecasting. The ready to wear industry had established itself in America much earlier than in Britain. While copying the styles of Paris relatively quickly was a possibility, a need was becoming apparent to have more insight into colour direction at an earlier stage in order for the fibre, yarn and fabric manufacturers to be prepared for the needs of the garment manufacturers. (Burns & Bryant, 1997)

2.4.6 Post war influences.

The end of WWI encouraged much celebration. By now the behaviour of women had changed considerably, since they gained freedom and independence, which had become socially acceptable. Women had worked in jobs, previously held by men, during the war effort. By 1918 they had won the right to vote in Britain and in the USA by 1920. Many new influences became important, dancing, music, sports hobbies. Art crazes such as Op Art, Art Deco and Art Nouveau were popular at this time. The latter brought art products to the lower classes. Theatre also became popular and costume designers were much copied by fashion designers, such as Bakst’s designs for Diaghilev’s Ballets Russes, copied by Poiret. Inspiration for fashion design at this time was extracted from almost anything and everything. (Callan, 1998)

2.5 The 1920’s.

The man made fibre industry began to increase rapidly in its research, and production methods were further developed to attain higher speeds, more varied yarns and fabrics and a higher end product quality. Possibly the most problematic aspect for the ready to wear industry in Britain was garment fit. It was in this area that bespoke, or haute couture, had excelled. Garments were made to fit the individual client. The present day standard sizing system was not adopted from the USA until much later. However, the loose, straight silhouette of the 1920’s eliminated many of the problems of fit and the ready to wear industry was able to establish itself easily, offering completely made garments, off the peg, giving an acceptable fit for many due to the style of the era. This enabled the introduction of a new marketing concept, the boutique. A concept that the department stores were to later adopt. (Burns & Bryant, 1997)
As cheap fabrics became more readily available along with easy to follow paper patterns, the establishment of the second hand clothing trade and cheaper ready to wear garments, all contributing to make fashion more readily available to all classes. Middle and lower classes were increasingly better off and women were being educated at colleges and universities. Fashion had become instrumental in producing new jobs for women sales assistants.

2.5.1 The USA influence.

By the 1920’s New York had established itself as a fashion city. Travel was becoming increasingly easier and cheaper, allowing manufacturers to travel for inspiration and knowledge of fashion direction. Entertainment was also becoming big business, and with the development of Hollywood, the cinema became an important place for the general public to frequent. With this, actresses became excellent promoters of fashion, displaying styles, colours and images to all.

2.5.2 Early consumer demand.

By the mid 1920’s, the younger generations became important directors of lifestyle and fashion. Cheaper colour production techniques in printing promoted an increase in popularity of magazines. Accurate colour and details were necessary to disseminate the precise look. As women increasingly displayed their own freedom and individuality, consumer demand was beginning to be felt by the fashion and textile industry.

Paris couturiers were now beginning to realise that their leadership was becoming threatened. Bespoke became less profitable and less important. Many houses realised that the outlook of their business had to change to survive, with this, their design ideas now became more marketable than the actual bespoke garments made for individual clients. (Mendes, 1999)
2.5.3 Tobe Associates.

In 1927, Tobe Associates consultancy was established in the USA by Tobe Coller Davis. While it is uncertain if this was the first consultancy of its kind, it was undoubtedly the most important one at this time. Finally a company existed that could concentrate on the fundamentals of fashion direction to be delivered to the manufacturers in exchange for a fee, freeing the manufacturer of this process enabling them to concentrate their efforts on production. Obviously as many manufacturers were supplied the same information, a theme was set and followed by the subscribers of the company. Consequently, if a theme is promoted in mass and made readily available, then there is a higher degree of successful sales, as the population recognised the theme as the in look. Another important fashion directive was formed in USA in 1931, The Fashion Group. (Burns and Bryant, 1997)

2.6 The 1930's.

By the 1930's, there had been much development in the knitwear industry. Designer, Elsa Schiaparelli often used knitted fabrics in her designs, this helped to upgrade the image of knitwear. The ready to wear sector of the industry was by now well established, and the man-made fibre industry was developing new synthetic fibres such as, nylon.

2.6.1 Retail.

By the 1930's, the boutique had become a very influential mode of fashion marketing. Mass production needed mass marketing techniques. This concept was very much identified and expanded upon by Marks & Spencers. In 1930 they adopted the use of their private label ‘St. Michael’. During the early 1930's they established their development department and their design department in 1936. (Malossi, 1998)
2.6.2 The need for fashion forecasting.

Haute couture fashions became much more outrageous, quite possibly to distinguish them from the ready to wear fashions that were more practical in style and therefore meeting the demands of the mass population. However, it would appear that the less frivolous females were looking for more practical styles and designs that better reflected their moods, differing social behaviour and leisure pursuits. The ready to wear industry was increasing in popularity, large department stores began to employ fashion buyers. These people needed insight into the demands of the consumer and also knowledge of likely future fashion trends, as the rate of change, and direction of fashion change began to gain momentum.

2.6.3 The British Colour Council (BCC)

In 1931 The British Colour Council (BCC) was formed and played a key role in the forecasting of seasonal colour palettes. Their information was presented to fibre, yarn and fabric manufacturers in advance of the appropriate season. (Worth, 2000)

At this time, the responsibility for colour direction was very much with the manufacturers. As the communication link between the consumer and manufacturer increased, it became more difficult for the manufacturers to understand the consumers' needs in an increasingly competitive climate.

2.6.4 Garment production problems.

The fashions of the 1930's became more stylized and fitted. This was a problem for the British ready to wear industry as a standard sizing system had not yet developed here. The use of shoulder pads promoted in couture designs however, relieved some of the problems encountered with fit.
2.6.5 Further influences.

In 1937 Carlin International was established offering manufacturers an alternative source of forecasting information. By the end of this decade the British fashion industry was threatened by the onset of World War II. The influence of war restricted the industry’s output throughout the next decade. Uniforms and work wear took precedence over fashion, and fabrics were rationed. Cinema became the focal point not just for entertainment purposes but also for the dissemination of news.

2.7 The 1940s.

The 1940’s became very much a mend and make do era as manufacturers were restricted on the amount of fabric used in designs and also styles were restricted. However, while the availability of new fabrics and garments was highly controlled, women were using their own dress making and hand knitting skills along with their own creativity and design ideas to produce their own individual look. Old clothes were up-dated with new buttons and trims, wealthier ladies paid bespoke seamstresses to make new garments from their husbands’ suits while they were at war. The need to look and feel womanly in an otherwise male dominated and unsettled period became the driving force of style at a time of war and depression.

2.7.1 The fashion industry.

In 1944 The Fashion Institute of Technology was formed to support the New York fashion industry. In 1945 Parisian couture was re-established. Balmain and Amies among others opened their houses. Frederick Starke showed the first wholesale collection in couture style. This had a great influence upon the status of the ready to wear industry. (Callan, 1998)

The current sizing system had also being adopted by Britain from the USA. Much more development in the synthetic fibre industry was encouraged by the war, as it was difficult to obtain imported natural fibres.
2.7.2 Post war

Important developments in the man made fibre and yarns industry accelerated after the war and Dior promoted his 'New Look'. In 1947 the Royal College of Art opened their fashion school responsible for producing many of the designers of the latter part of this century. Manufacturers formed the London Model House Group. They were responsible for the adjustment of the timing of fashion shows in accordance with more manageable time scales of production and promotion within the retail season calendar. The USA standard sizing system began to be employed by British manufacturers and designers improving the fit of ready to wear garments. By the end of the 1940's Balmain had opened his boutique and many other couture designers were producing ready to wear or pret-a-porter collections. (Burns & Bryant, 1997)

The London Model House Group was formed in 1947, by a group of manufacturers. They made efforts to begin to co-ordinate a structure to the industry through the introduction of seasonal stock in the retailing sector. This assisted the manufacturer to work to deadlines on the heavier weight clothing associated now with the Autumn/Winter season and the lighter weight garments of the Spring/Summer season. This system is still in use today, though with the changing climate in Britain, the timing of stock change over in stores may benefit from a further restructure.

2.8 The 1950's

During the 1950's technical developments in spinning, yarn development, weaving, knitting and garment production rapidly increased. By now colours and fabrics were establishing a more seasonal direction on the high street, a follow through from the forecasting and exhibition directors. Paris and Italy were both now important cities for the British and USA manufacturers to visit for inspiration.

2.8.1 Driving force

The younger generations were beginning to enjoy increased spending power, fashion became an ideal commodity for their freedom of self-expression and individuality, and focused on this market. Hence, fashion became more directed towards the younger generation.
With more women employed, easy care fabrics and fibres became of prime importance to manufacturers and many promotional tactics were developed to promote the need to the consumer.

By now the social revolution of all classes was beginning to be established. The poor were less poor and the wealthy were becoming a less elite breed as more business entrepreneurs joined the higher earnings bracket. These people however, were less likely to relinquish their roots for the sake of status (Rouse, 1989).

In 1954 Chanel re-opened her house and aggressively promoted her style in still a predominantly male environment. The following year another dominant female designer of the twentieth century, Mary Quant, opened her first boutique in London. At this time, Parisian couturiers were closely watching the directions of the USA ready to wear industry, influencing the pret-a-porter collections. This highlights the turning point of the importance of ready to wear in favour of bespoke. (Baudot, 1999)

By the end of the 1950’s, music increased its importance in entertainment and consequently began to influence fashion. In 1959 the Barbie doll was marketed as the first adult looking doll. It’s fashionable wardrobe promoted the fashion concept to an even younger generation. Also in 1959 the major international textile exhibition, Interstoff was established.

2.8.2 The need for forecasting.

The fashion disaster of the late 1960’s and early 1970’s, when the midi skirt was introduced as a result of a misinterpretation of consumer demand by the manufacturing industry, led to serious financial loss and business closures. While not the first costly fashion flop of this century, it was certainly the most devastating to the industry and compelled the need for more accurate fashion direction prediction to prevent this kind of mistake from happening again.

During the 1960’s more colour and fashion consultancy businesses were established, including Informa Inc., Promostyl and International Colour Association (ICA) who predicted trends eighteen months in advance.
2.9 The 1970's

By the early 1970's fashion lacked direction resulting in no single influential driving force being identifiable. Music became more varied and so did the style of associated clothing. Consumer demand became more varied which influenced a need for market segmentation in retailing. Possibly the many fashion consultancies now in operation lacked a cooperative theme for any particular season. No longer could designers or manufacturers dictate to the consumer and forecasting the demands now became a very important ingredient for the industry. Adding to the problems of the fashion and associated industries, Britain's industry on the whole, but particularly the heavy industry, was hit by economic recession. Consumer spending once again became limited, though support was available from the state in the form of various benefits. Despite the recession, many known and unknown designers opened houses and boutiques, though the emphasis was on ready to wear or pret-a-porter. Fashion retail became large scale and lost the intimacy of the boutique. This increased the effects of the lack of direction of fashion. Still more forecasting companies became established, possibly in an attempt to re-direct fashion in an otherwise receding industry.

2.9.1 The retailing concept of 'Next'.

By the end of the 1970's, Next hit the high street with their new concept of retailing. They used a limited colour palette per season and exploited display methods for optimum sales as their key marketing strategy. This emphasised the productive use of colour in fashion retailing. This may have been the concept of the initial colour forecasting companies and exhibition directors, forty years previously. (Gray, 1998)

2.10 The 1980's

As Britain began to recover from the recession, computer technology became increasingly utilised in the fibre, yarn, fabric and garment production sectors. Haute couture lost its authority as fashion director, as many sources became acceptable and generally used for inspiration, making fashion styling more varied to coincide possibly with the changing lifestyles of consumers.
Consumers became more individual as lots of different options of leisure pursuits were available and promoted to them. Sports and fitness became important and had a large impact upon casual fashions throughout the 1980's and 1990's. Television influenced the romantic styles promoted by period dramas and high fashion styles promoted by American soap operas.

2.10.1 Market segmentation.

The need for retailers to segment the market became ever more apparent due to a high population with widely varying lifestyles and interests. Market research became an important tool for collating information about the consumer to assist retailers to target their market.

2.11 The 1990's and the new millennium.

Fashion retail sales figures of this final decade of the twentieth century showed a decline in the industry. No particular driving force could again be positively identified for fashion direction. Much of the 1990's were dominated by the colour, or non-colour, grey. Grey is generally associated with non-movement, lack of motivation; stalemate. An accurate account of the effect it had upon high street sales.

The only glimmer of hope offered to the industry would appear to be the promise of the return of colour to the high street in the new millennium. This was felt to be implied by many trade magazines, as there appeared to be support and promotion of the concept of better utilising market segmentation by including the option of consumer psychological data as well as demographical information.

Figure 1, shown over the following nine pages, is a compilation of information taken from the study of the three hundred year time period to demonstrate the driving forces of fashion and the introduction and growth in the specialist forecasting sector. The full dateline chart accompanies this thesis in CD-ROM format.
Figure 1.

Fashion forecasting and the driving forces of fashion.

1700 - 2000

Key.

- Technical Developments.
- Availability.
- Trends.
- Influences.
- Marketing Influences.

Driving Forces.

Forecasting.

Consumer Demand.
1671 first waste silk spun in Great Britain.

1718 silk spinning development.

1719 first silk mill in Great Britain.

1738 cotton spinning development.

1743-1755 more silk mills opened in Great Britain.

1760s-1780s more cotton spinning development.

1758 Knitting machinery development.

1735 Kay's flying shuttle was invented.

1740-1760 side hoops & false hips were common.

1750-1795 The Louis XVI period.

1770-1832 The Lady's Magazine.

Population in Great Britain in 1700 was circa 9 million.
1785 Power loom development.

1787-1790
Flax & wool spinning development.

1791-1798
Knitting machine development.

1790s
Introduction of inorganic colourants.

1790
First sewing machine patent.

1790s rich printed patterns.

1794
Research into permanent colour dyeing.

1794-1800
More cotton spinning developments.

1800s
Mangle for mending & mending production developed.

1801
Pattern cutting device developed.

1800s
Many improvements in cotton spinning.

1780-1850
Popular dress colours were pale, deep or neutral.

1790s
Women's dresses were commonly made of woollen, cotton or linen fabrics.

C. 1780s-1790s
Long sleeves were very fashionable.

1795-1804
The Directory period.

Second-hand clothing sales.

Cream & dull crimson silks, brilliant red wools.

Cotton fabrics accounted for 80% of fabrics used by the turn of the 19th Century.

Juliette Decamer, a banker's wife, fashion leader of the early 1800s.

Population in Great Britain in 1800 was still circa 9 million.

1800s
George Beau Brummell.
1850-1856
Perkin's
aniline dyes.

1856 crinoline.

1858-1860
widest hem
 circumference.

1860s
Cellulose acetate was developed.

Further developments were made to looms during the last two decades of the 19th century.

1862 First International fabric exhibition held in London.

1863
Butterick paper patterns.

1870
McCalls paper patterns.

1870s
Bustle, tea gowns & square necklines were popular.

1870s
Strong, rich colours.

1870s
Tussah silk.

1880-1910
Edwardian period.

Circa 1850s paper patterns were available in magazines.

By the mid-19th century, department stores were becoming very important in the dissemination of fashion.

1867-1868 evidence of style forecast in La Belle Assemblée.

Sports boom popularised knitwear.

1856 Worth opened his Paris house.

1858 Queen Victoria

1849 Development of the latch needle revolutionised the knitting industry.

1860s
Further developments were made to fibre preparation & spinning machines during the second half of the 19th century.

1864
Mercerisation.

1849
Development of the latch needle revolutionised the knitting industry.

1860s
Cellulose acetate was developed.

Further developments were made to looms during the last two decades of the 19th century.

1856
Cirnoline.

1858-1860
Widest hem circumference.

1860s
Cellulose acetate was developed.

Further developments were made to fibre preparation & spinning machines during the second half of the 19th century.

1862
First International fabric exhibition held in London.

1863
Butterick paper patterns.

1870
McCalls paper patterns.

1870s
Bustle, tea gowns & square necklines were popular.

1870s
Strong, rich colours.

1870s
Tussah silk.

1880-1910
Edwardian period.
2.12 Summary.

Inventions and developments in the fashion and textile industry over the past three hundred years have been many and varied. As the industry grew in capacity and importance, and became capable of producing higher quality yarns, fabrics and end products at high speeds, so the demand from the consumer increased.

The earliest evidence for the need of forecasting was found to be circa 1825. However, it was a century later when possibly the first forecasting company established in USA. During the 1930's similar companies established in Britain. By the 1960's colour and fabrics had become more seasonal and more forecasting companies established during the following two decades in Britain, the USA and in Europe.

It would appear that the consumer always has been and should always be considered to be amongst the major driving forces of fashion. In recent decades spending money on clothing has become less of a necessity and fashion has become more of a superficial commodity. Rarely does the consumer buy a garment, particularly for adults, because it is absolutely needed, more because it is desired. There are many more activities available for the consumption of money competing for the consumer's disposable income.

Fashion has become a global phenomenon, with cheap and speedy import/export, the manufacturing of fashion has become globally competitive. Forecast companies sell their trend prediction packages throughout the world, offering a narrow palette to a wide captive audience. However, retailers have recognised the need to segment the market and source products specific for their target market customer.

Marketing techniques and consumer research of desires more so than needs have become ever more important to the survival of the fashion and textile industry. Therefore, the current method of colour forecasting needs to be better understood to be used to its optimum capacity.
3.

Evaluation of

Colour Forecasting Literature.
3.

Evaluation of colour forecasting literature.

This stage of the research process focuses upon the value of current colour forecasting literature in order to pinpoint areas that lack in depth knowledge and thus to identify pathways for primary research.

The previous chapter identified when, how and why the need for colour and fashion forecasting came about and how this specialist sector of the industry evolved over the past three hundred years. The purpose of this chapter is to examine the validity of the current literature available at present and to establish the current body of knowledge.

3.1 The importance of colour forecasting in the fashion and textile industry.

There appears to be a commonly held opinion that the forecasting profession has become almost the backbone of the fashion and textile industry on a global basis. As it is the primary sector, i.e. the fibre, yarn and fabric manufacturers, that direct the availability of yarns and fabrics including the colours, textures and fibre content aspects for the subsequent related industries, it is often perceived as their responsibility to accurately anticipate consumer demand. This concept was emphasised by (Benson, 1999) with particular reference to colour, though no explanation or reasoning was given. From the author’s current findings it could be suggested that this may be due to the concept of high productivity at low cost. It is cost effective for the manufacturer to reproduce garment styles for many seasons, with little or no adjustments to the pattern cutting and making up processes. Consumers also have a tendency to favour particularly comfortable garments, and will generally be happy to buy the same garment in more than one colour. This concept was discussed by (Edelkoort, 1999). A combination of these two factors would be detrimental to the fashion industry if not for the possibilities that colour offers to update those styles. The manufacturer only has to change thread and trimmings and the consumer is able to buy a favoured, comfortable style in the new season’s colours. This demonstrates the importance of colour within the fashion and textile industry.
The following statement by (Healey, 1984-5) emphasises the importance of colour forecasting within the primary market sector.

"The fibre producers, who rely on the spinners to promote their fibres are the most influential in relating forecasting information for each season."

The product of the colour and trend forecasters is their trend packages that they sell to the industry. The product of the fibre, yarn and fabric producers are the raw materials required by the garment manufacturers, that they use to produce garments for the retailers to sell to the consumers. The product of the fibre, yarn and fabric manufacturers is of greater importance than the product of the colour forecasters, which it could transpire to be dispensable without any real detriment to the industry, provided that the primary sector took effective control of the use of the colour forecasting process. The fact that the forecasting profession exists is probably due to the uncertainty felt by the various manufacturers who subscribe to the services. One has to wonder who fuels this uncertainty. Though it must be recognised that the forecasters promote a colour story creating a consensus and that in itself is important, this is accentuated by the role of the trade exhibitions, later discussed in section 3.2.1.2.

(Hann & Jackson, 1985) quoted the interesting statement below, made originally by the fashion author Gregory, regarding his affirmation of manufacturers' tactics;

'... deliberately reduce the psychological utility of goods in the hands of consumers, so that they must be replaced before their physical utility is exhausted.'

(Hann & Jackson, 1985) also stated that Gregory;

"... argued further that such 'purposeful obsolescence' is maintained by manufacturers on a seasonal or annual basis in order that a higher sales volume can be reached than would otherwise be the case."

The following statement quoting (Brannon, 2000) also emphasises the concept of manufacturers tactically driving fashion through the use of seasonal colours. This further demonstrates the importance of colour for the industry.

"Stimulating sales is the driving force behind colour forecasting .... Even when the basic product stays the same, changing the colour gives a sense of something new."
(Linton, 1994) quoted Maruchi Santana's perception of colour as "the emotional component of marketing." This train of thought could also be applied to the concept of forecasting, and would support the controversial opinion of it being more of a marketing tactic. While initially recognised as a necessity by the ready to wear industry, due to the lack of communication between designers and the consumers, unlike the direct relationship the couturiers' had established with their clients, forecasting may be considered as a driving force of fashion. On the other hand, it could be construed as a hindrance to the industry's growth. This conflict of viewpoint can be further debated through the following statement.

"Gregory argued that fundamentally purposeful obsolescence discourages rational competition. If there were numerous sellers of a standardised product, seller's rivalry would generally take the form of price cuts or improved quality or both. In other words, manufacturers would charge less for the same product or would sell a better or more durable product for the same price, and all rivalry among sellers would therefore be in the form of price competition. Gregory argued that these conditions are rarely evident in the marketing of fashion products, but instead a form of 'styling rivalry' is introduced. This has the function of stimulating sales without improving the product .... the result, a 'monopolistically competitive market is prevalent in the fashion business.'"

(Hann & Jackson, 1985)

Bearing in mind that Gregory put this notion forward in 1947, it would appear that today, over fifty years later, style rivalry has been replaced by price rivalry to the detriment of the fashion and textile industry. This move may have been directed by the existence of colour forecasting. If the same fashion story is promoted world-wide, every manufacturer religiously following the same information inevitably produces similar products to sell to consumers globally. Style rivalry can not prevail as creativity is surpassed and therefore price rivalry occurs, stifling the fashion and textile industry as opposed to assisting it.

(Kirby, 1994) found through primary research, that the general consensus within the industry was that the investment of time spent on colour forecasting was considered to be of a greater necessity to a company than investment of large amounts of money. This would suggest apparent support for the concept that a successful forecasting package with a one off financial expense would be of considerable value to the industry. This package could be for their own use, assisting them to make their own forecasts as opposed to paying expensive subscriptions to the specialist forecasting sector.
(Fiore & Kimle, 1997) claimed that the influence of the forecasters upon the industry is highlighted by the power of promotion and advertising. The initial colour groups such as the Colour Association of the United States (CAUS) and the Colour Marketing Group (CMG) are made up of individuals who are in turn connected to the smaller colour forecasting services. Obviously they are all going to promote the same colour stories after the initial colour palettes have been jointly decided upon and approved. The text used the words, 'anticipate public demand', whereby manipulate could be more precise.

(Fiore & Kimle, 1997) offered the following statement quoting David Wolfe, of the forecasting service D3 during an interview, which adds weight to the notion of manipulation.

> "When I present the actual European and American collections, they serve as confirmation of the trends we predicted."

It would be rather foolish of the company, if the collections they produced contradicted their previous predictions, clearly making a mockery of the forecasting service. Another statement by Wolfe further emphasised the apparent conspiracy directed by the forecasters.

> "...First, we want to introduce people to our thinking. Second, it spreads the gospel. The more we guide, the more wide spread our influence."

(Fiore & Kimle, 1997)

While this statement reinforces the concept of forecasting as being self-fulfilling, it is not the intention to lose sight of the importance of seasonal colour stories, for the continuation of sales for the fashion and textile industry. The hype does not put into question the necessity of the process, rather it is the ability to reflect or anticipate consumer demand or desire accurately that is questioned.

(Hipsey, 1995) presented further interesting points through primary research, finding that 44% of the fashion retail respondents used forecasting companies, 63% of which felt that the information they used was reliable. 78% of respondents had their own in-house forecast team. Many of the respondents were however large companies such as Next, Selfridges, Top Shop and Dorothy Perkins.
Premier vision was found to be the most popular exhibition as a source of inspiration. It is therefore easy to understand why this exhibition is the focus of the industry, which is said to act as a colour filter for the industry. (Hipsey, 1995) also stated that Next, M&S, and Selfridges claimed they could exist without the forecast publications. As they already have their own forecasting teams in place, it can not be interpreted that they dismiss the need for forecasting, merely recognising that it can be achieved by individual manufacturing or retail companies.

(Edelkoort, 1999) recognised the competitiveness of the fashion and textile industry as it has become a global business. This is proposed as the reason for many manufacturers and retailers investing in trend prediction information, basically to survive. However, rather than staying one step ahead of the competitors, it would appear that everyone is working with the same information.

The importance of colour forecasting for the industry was emphasised by (Roweth, 2000) who referred to the lack of direction in the industry and the lack of colour coordination during the 1970's, when the industry was heavily promoting mix and match separates to assist the consumer during the economic recession. However, with shop layouts resembling jumble sales, the industry became in more need of assistance. Retailing became more focused during the 1980's as the retailing company Next introduced its colour coordinating marketing strategy and through the introduction of target marketing.

(Brannon, 2000) recognised that,

"Forecasts do not provide 'the answer'. Instead, forecasting opens a window on the probabilities of the future."

Page 24.

Also,

"Colour forecasts are a directional indicator only emphasising direction of hue, value and intensity with view of its application and not actual predictions of precise colours."

Page 149.

It is therefore considered that the role of the information user is to be creative in the application of the trend predictions, to offer the consumer something different. However, the uncertainty felt by the industry would appear to discourage this activity.
3.2 The methodology of colour forecasting

The basic forecasting methodology was outlined by (Diamond & Diamond, 1997), (Hipsey, 1995), (McIlvenna, 1991), and (Healey, 1984-5), though the process was not reported in depth. (Brannon, 2000) recognised that while methods may alter slightly between forecasters, all aim at predicting 'the mood, behaviour and buying habits of the consumer.' (Linton, 1994) put forward the concept that colour forecasting is a process of 'identifying contemporary images.'

Patricia Verlodt, (Linton, 1994) recognised colour forecasting methodology as having specific tools. The first is past experience; i.e. historical trends, research, experience and intuition. She suggested that design can more often than not influence colour, that is by shape, size and texture.

(Benson, 1999) briefly described the outline of the colour selection process that takes place from the initial colour meetings to the retailers, though no attempt was made to elaborate upon the actual methodology of each stage of the process. (Healey, 1984-5) on the other hand, gave a good, but not detailed account of how the British Textile Colour Group (BTCG) compiled their colour palette to present to Intercolor, including how the international colour card is then decided upon at Intercolor. (Hulse, 1997) also researched and reported the working methodology of forecasting of the BTCG.

An important disclosure was reported with reference to the policy of Intercolor by (Healey, 1984-5), as given below. Design associate, Zina Roweth, who had stressed the importance of tonal value as opposed to the actual hue, also supported this concept.

"... the idea of selecting a single colour to be the shade for a particular season is no longer relevant, as colours are not used like that by designers now..."

(Healey, 1984-5)

Irene Zessler, (Linton, 1994) gave an account of how the Peclers Paris colour range is compiled. A set of criteria is adhered to for the number of colours, the colour combinations and illustrations used to convey the story. Brainstorming sessions were reported to be an integral part of the process. It is endeavored to identify and follow the natural evolution of fashion for the forecasts. Though details of how this is achieved was not recorded.
Alison L. Webb spoke of the importance of timing and that,

"A large measure of forecasting methodology is simply knowing where you have been and having a sense for visual rhythm of colour palettes as they work their way through the bell curve."

(Linton, 1994), Page 203.

Though (Healey, 1984-5) discussed the services of the International Wool Secretariat (IWS) and the International Institute for Cotton (IIC), no explanation was attempted to demonstrate how they select colours for their trend packages, other than their attendance at the BTCG and Intercolor meetings.

(Fiore & Kimle, 1997) gave a workable methodology for researching a diverse range of aesthetic design attributes that can clearly be applied to the process of colour change through time as a valuable tool for colour forecasting. Two of the objectives of this methodology were to understand the evolutionary nature of the product and to predict the future preferences based upon transition of aesthetic form and social context. Both of these concepts were clearly discussed and offer a potential basis for a systematic approach to understanding the process of colour forecasting. The term evolution was used to convey slow change and relates to change over time, or rate of change. Transition was used to mean gradual change or direction of change. This can be applied to any aspect of aesthetic design attributes, including colour, as pointed out in the following quotation taken from page 379, "recognising the transition of the product can help predict the future direction of the aesthetic form." The two concepts, direction of change and rate of change are considered potentially very important tools that could be employed for the study of the colour forecasting process.

The methodology proposed by (Fiore & Kimle, 1997) works upon the collection of data of the products characteristics, in this case, colour in terms of hue, value and intensity and the frequency of occurrence. A suitable means of accurate measurement of these three colour characteristics need to be investigated and identification of rate of change over a specified time. This method appears to have provided inspiration and direction for the foundation of a methodology to produce a satisfactory model to define the process of colour change for forecasting purposes and the evaluation of the importance of colour precision from concept to end use within the fashion and textile industry. Ideally a system that can work in conjunction with sales data could provide a very valuable colour forecasting tool. It must be kept in mind that the consumers' demands and desires must be accurately anticipated and met, as pointed out in the statement overleaf.
“Colour forecasting groups help to stimulate the discovering or rediscovering of new colours and combinations. Their purpose is not to force a new colour upon the innocent consumers, but to show them how new colours can enrich their lives. The one important thing that all colour forecasters must keep in mind is that the consumer has the final say in the matter.”


(Tate, 1984) put forward a method of planning a colour story. This outlined how a designer may build a colour story for a season. It is suggested that five colour categories should be incorporated into a colour story by the designer, these are shown below.

1. Some Fashion Colours.
2. Some staple Colours. (Typically a shade of blue, a shade of pink, neutrals, i.e. black and white)
3. Warm Colours.
4. Cool Colours.
5. Neutrals and Darks.

8 – 12 colours are suggested for the whole range.

There was no explanation of why this formula was suggested, whether it works, or whether or not it is generally used. It should be understood that no one colour fits into only one of the five categories. For instance, the colour burgundy may be considered a fashion colour for a particular season, a warm colour and a dark colour. This one colour could therefore fit in to three of the five categories.

(Brannon, 2000) also put forward a working model for colour forecasting, in the form of a systematic step by step model of developing a trend forecast, shown below.

**Step 1** Identify the basic facts about past trends and forecasts.
**Step 2** Determine the causes of change in the past.
**Step 3** Determine the differences between past forecasts and actual behaviour.
**Step 4** Determine the factors likely to affect trends in the future.
**Step 5** Apply forecasting tools and techniques, paying attention to issues of accuracy and reliability.
**Step 6** Follow the forecasting continually to determine reasons for significant deviations from expectations.
**Step 7** Revise the forecast when necessary.

A trend forecast should identify the source, fundamental mechanism, direction and tempo of the trend.

Page 25.
(Brannon, 2000) also proposed a second systematic step by step model, discussing the difference between the two terms tame and wicked problems. Tame problems were identified as being simplistic in nature whereas wicked problems were characteristically complex. A method of solving tame problems as thinking within the perimeters of a box of tools, namely assumptions, beliefs, rules, tradition and comfort zone was defined. The model for which is shown below.

**Step 1** Define the problem.
**Step 2** Generate alternative solutions.
**Step 3** Specify criteria to use in evaluating the solutions.
**Step 4** Apply the criteria to choose a solution from among the alternatives.
**Step 5** Implement the solution.
**Step 6** Collect feedback on the effectiveness of the solution.

Wicked problems were considered to require thought outside the box, including ideas from other fields such as; images, cultural arcs; visualisation, metaphors; experiments, and patterns; play. The model is shown below.

**Step 1** Generate the greatest possible understanding of the problem from diverse viewpoints. The trick is to avoid seeking closure too quickly or bogging down into polarizing argument between positions. Instead, generate a large number of questions that start out: "What if... What is... What should..."
**Step 2** Sort through the questions for those that need to be pushed further.
**Step 3** Look for relationships and patterns.

A particularly interesting concept of potential value was referred to by (Brannon, 2000) as The Pendulum of Fashion. A swinging pendulum was used as a visual model to demonstrate the extremities of a fashion trend. The figure illustrated such extremities as tight — loose, long — short, wide — narrow. This model could easily be adapted to colour cycles, though many aspects would need to be taken into account. Bright, pure colours could be placed at one extreme and achromatics and neutrals at the other extreme, tints, tones and shades could fall between. This could be applied to individual hues; red, blue etc., however, intensity and value would need to be accounted for. Another consideration would be colour temperature, i.e. warm and cool colours. Determining the rate of change and direction of change for each of these aspects would appear to be the essence of colour forecasting.
Much reference was given by (Brannon, 2000) to the Luscher colour test for colour preference and personality, though it was stated that this type of information is not potentially of much value to the colour forecaster for the successful prediction of colour trends.

Another interesting model given was specific to personal colouring using the popular colour consultant’s seasonal approach to categorising colour preference and suitability to personal hair, skin and eye colouring. It does however, incorporate the three fundamental aspects of colour; hue, intensity and value.

<table>
<thead>
<tr>
<th>Winter</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cool Undertones</td>
<td>Warm Undertones</td>
</tr>
<tr>
<td>Clear/Bright colours</td>
<td>Clear/Bright colours</td>
</tr>
<tr>
<td>Intense colour</td>
<td>Intense colour</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summer</th>
<th>Autumn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cool Undertones</td>
<td>Warm Undertones</td>
</tr>
<tr>
<td>Subdued colours</td>
<td>Subdued colours</td>
</tr>
<tr>
<td>Less intense colour</td>
<td>Less intense colour</td>
</tr>
</tbody>
</table>

If this model depicts an ideal, or the average percentage of a population, then colours available to that population should ideally be proportionately balanced between the four categories. This would then be incorporated in the forecasting model of the target market sector.

Warm and cool colours were discussed by Everett Brown (Linton, 1994). These were referred to as keys 1 & 2. Cool, blue based colours are classed as key 1. Key 2 have warm, yellow undertones. Individuals are said to fall into one of the two keys, and their colour preferences therefore follow the key of their natural personal colouring, and consequently individuals are said to look and feel better surrounded by those colours.

Diane Calvert found that when comparing colour forecasts, autumn 1993 in one forecast had a green bias; yellows, golds, blues, greys, browns. Warm reds, oranges, purples complemented the green bias hues. She found that this bias was also common for the blue/green colour story of the previous season. (Linton, 1994)

(Linton, 1994) illustrated and discussed The Colour Image Scale, patented by The Nippon Colour & Design Research Institute, Inc. as a useful model. This 3-dimensional model made use of the three principle components, colour temperature, colour intensity and colour value, each occupying an axis on the model. This model was not dissimilar to that discussed by (Brannon, 2000).
(Green, 1994) quoted Deryck Healey as saying, “The colourist ... essentially communicates a focused idea.” This is considered to be a good analogy of the endeavor of the colour forecasting industry.

(Green, 1994) also quoted Li Edelkoort from World Review of Textile Design, 1991 as stating that “Intuition is the biggest tool: 70% is intuition or is linked to it.” In addition to this, Edelkoort had also expressed that intuition could be ‘trained like an athlete.’ (International Textiles, 1991)

The quotation from the World Review of Textiles given by (Green, 1994) continued as follows,

“... It is when one tries to analyse why one has made these choices that the philosophy emerges .... Step 2 – the questioning of the intuitive input is very important; intuition does not mean a thing on its own.”

This concept was further expanded upon by Edelkoort as she described the process of data collection as accumulation... “to gradually form a concept, a trend.... It is when one tries to analyse why one has made these choices that the philosophy emerges.” She perceived this step as a very important stage of the forecasting process, however, questioning the intuition is the part of the process that she never seems willing to elaborate upon or to expose to more in depth reasoning. (International textiles, 1991) This demonstrates how and why mysticism disguises the actual methodology and creates a monopolistic state for the forecasters. Also information specific to the subject of colour forecasting is limited and that authors are using the same sources.

(Edelkoort, 1999) confirmed her belief in the methodology being totally artistic in nature and that no way could a scientific basis be identified nor applied. She also credited merchandisers and buyers as having the same intuitive methodology when buying stock and that personal tastes are not influential. It was felt that this represented an ideal, how it should work, though evidence was found of a contradictory nature. (Brannon, 2000) for instance declared that,

“Forecasting is not magic practiced by a talented few with a gift of seeing the future. It is a creative process that can be understood, practiced, and applied by anyone who has been introduced to the tools.”

This reinforces the possibility of applying a scientific methodology for repeated use by a novice.
Julie Buddy had been involved in the colour consultancy profession for over forty years, working with many of the major fibre companies and retailers. She identified three main areas within the colour forecasting process; exploration, evaluation & analysis, finally collation of all the information into a fashion marketing concept. She viewed market research as a fundamental tool for the forecaster and the process of observation to be constant. Consumer segmentation was also pinpointed as an essential tool. (Buddy, 1992)

The following statement made by (Jarnow & Dickerson, 1997) recognised the importance of forecasting for the industry. It describes colour forecasting as being of a purely objective nature and that intuition plays no part in the process. This statement would appear to be of personal opinion.

"Such forecasts and predictions of fashion, however, are neither guesswork, nor a game, nor a matter of intuition. Rather, fashion prediction is one of the most vital activities in the industry. The successful forecaster recognises that fashion is neither haphazard nor mysterious, but a tangible force whose progress can be charted, graphed, understood, explained and projected. Basically, what fashion practitioners do is examine past experiences for clues as to what will happen today, and then analyse and evaluate today's activities for indications of what may happen tomorrow."

Page 50.

A question prompted from the study was whether or not the forecasters consciously conspire to protect their monopoly over the industry or whether they simply do not recognise that their methodology can be recorded and used in a systematic manner. This concept is further accentuated in the following statement,

"People in the fashion business seem to develop almost a 6th sense for weighing various factors and judging probable ups and downs of trends. Their apparent instinctive skill arises from years of experience in studying signs that may escape the untrained observer, just as the weather forecaster observes signs the rest of us may not have noticed and becomes adept in this work."

Page 51.

(Jarnow & Dickerson, 1997) recognised that the fibre, yarn and fabric industry ‘invests much time and money into fashion research’. This reiterates the need for a better method for their use as this is the all important market sector. The text also stated that the first decision to be made is that of colour.
The following quotation briefly describes the methodology used by a company.

"When putting together a colour line we review the best and worst sellers of the last season, check the computer readouts, have informal discussions with manufacturers and check the racks of department and specialty stores. We think of what colours have been missing from the palette for a while and which shades seem 'new again'. Many colours make the natural progression through the seasons; a wine becomes purple, the purple moves to a magenta and the magenta to a pink. No mystery – just logic. The final choice of a colour line is logic, research and 'gut feeling'. With it lies the success or failure of your next season."

Page 121/2

3.2.1 The outline of the forecasting process explained.

(Edelkoort, 1999) gave the following brief account of the methodology used by the forecaster. Colour representatives are collected on an ongoing basis in any form or substance, be it sweet papers, stones, fabric – whatever. These representations are stored in drawers relating to the hue. When the time comes to put together a new colour palette, biannually, colour representations are selected from the drawers in an intuitive manner. Basically she claims that she takes out of the drawer those colours which are most appealing to the eye. Many colours are selected in this way and laid out on a surface. Natural colour stories are then identified from the array of colour representations. Ideas for fashion begin to formulate around the colours and are then developed into story boards. The story boards are shown at colour meetings. All in attendance at these meetings, including fibre manufacturers, designers and forecasters, bring along their colour story boards that have been developed in much the same manner. The similarities are honed in on, these would include the inspirations used to support the colour stories and word associations as well as the actual colours. Discussions are then thrashed out and eventually a colour palette is mutually decided upon.

The following statement substantiates the reasoning for the similarities between forecasts for the same time zone.

"Although a conspiracy does not exist among colour forecasters to dictate colours, colour forecasters are in agreement the majority of the time. They attend the same fabric trade shows in Europe, shop in the same trendy boutiques and watch street fashion in Europe, Asia and America, and track the same media. They are members of one or more colour associations and collaborate with other members to develop industry colour forecasts."

(Brannon, 2000) Page 118.
Kay Stephenson Wrack (Linton, 1994) also recognised the similarities that other authors had identified.

“Occasionally, I have the uneasy feeling that everyone is reading the same magazines, attending the same shows, consulting the same sirens, feeding from the same table.”

Edelkoort continued her talk showing examples of presentation packages offered to clients. It was felt that this was actually the key element of forecasting, selling the idea. Nick Sullivan, associate of Arena magazine was once reported to believe that confidence was the key to forecasting and claimed that forecasters who have confidence in their predictions can easily sell them to the consumer. (Hulse, 1997)

(Hulse, 1997) researched the British Textile Colour Group, speaking to its founder member, Joanna Bowering. She told of how a panel of twenty five individuals bring together their own colour stories in the form of boards to the meeting. Each presents their boards conveying the moods, colours and reasoning that they anticipate for the future season. A consensus is formed on similarities of images, words, moods and colours. By the end of the meeting a colour card has been agreed upon.

The colour card is then taken to Intercolor, Paris, where twenty to thirty members from all over the world repeat the process again at this meeting, showing their country's colour stories. The resulting colour card is then disseminated to the fibre, yarn and fabric manufacturers for their interpretations. Those exhibiting at Premier Vision (PV) will also use PV's own colour card. It is the strength and certainty of the colour presentations at the exhibitions that instills confidence in the buyers.

Joanna Bowering professed colour forecasting to be one of a decision making process, yet the author found responses from forecasters to be one of intuition. Some of the panel, were reported to confess to the whole thing being entirely made up. This rather stresses the concept of secrecy to protect the monopoly.
3.2.1.1 Analysis of visual forecasting processes.

The (BBC video, 1991), The Colour Eye, recorded Dale Russell of The Colour Group putting together colour stories. It was noted that lifestyles were an important influence when considering themes. The information made available to the group included colour story ideas presented as mood boards for discussion and technical information; such as updates in technology. The decision process worked on the principle of brainstorming workshops.

The video demonstrated how two headings were decided upon to represent two selected lifestyles. Images were then sourced from a collection of magazines that reflected the two lifestyle profiles. Boards were then developed incorporating five themes within each of the two main lifestyle themes. Colours were then selected from the imagery using the following technique: If one squints while looking at the story boards the images disappear, and only the strong colours are seen. These stronger colours that stood out were selected to represent the colour palette. The Dulux Colour Dimensions colour order system was used to record the colours selected. Further discussions then took place between the individuals involved to reduce the colours of the two palettes down to only eight to twelve colours, for each of the two lifestyle themes.

Though the outline of the procedure was well demonstrated and explained, no attempts were made to show how the individuals had used thought, decision and reasoning processes to decide upon any of the selected imagery, or colours for the colour palettes.

3.2.1.2 Analysis of a trade exhibition.

(International Textiles, 1992,) gave a pictorial guide of sixteen photographs with a minimum description of how the trade fair, Premier Vision (PV) is assembled. The exhibition begins life with the meeting of the panel members at the PV office. The panel is reputed to consist of no less than eighty members from all areas of the fashion industry. The panel work on the colour ranges eighteen months ahead of the specified season. Meetings are held for members to discuss the season, the market and to select a colour range. The colours are then grouped into themes and market sectors.
Further discussions are undertaken to refine the colours into an acceptable shade card. It was not stated how many colours are selected, nor was any further indication given of how the colours are selected, or where the inspirations come from.

Subsequent meetings are arranged in France, Spain, Italy, Belgium and Great Britain, presenting the colour ranges to the fibre, yarn and fabric companies. One month before the exhibition the Paris office receive weavers’ fabrics for display. Each fabric sample is checked against the PV colour shade card. If colours are contained within the samples that are not represented on the colour card, those fabric samples are rejected. This ensures that the whole exhibition relates to the colour stories set by the panel for that season, instilling and promoting a consensual theme.

Successful fabrics are used for display, the fabric resource library and samples of each are sent to Li Edelkoort for the assembly of her audio-visual presentation. Her team collates samples of the same colour to present as the strong colour story. The rest of the colours are promoted as the fashion or accent colours.

Around four hundred and fifty trend boards are made for the exhibition supported by a wealth of accessory props to help communicate the mood and to accentuate the colour stories.

Trade shows and exhibitions were discussed by (Benson, 1999), though an important point was neglected, that of the set criteria of colour by the trade exhibitions as previously discussed. This regulation ensures that everyone exhibiting conforms to a trend supported by the exhibitions own prediction package. Buyers will pick up this continuity of colour and read it as the trend colours. Buyers include some or all the colours in their selections and so accentuate the trend and collectively deliver it to the high street where it is assumed that consumers will recognise the colour story promoted throughout the high street. The predicted colours therefore become the reality, courtesy of clever promotion.

(Healey, 1984-5) discussed the importance of trade fairs. Mention was given regarding the colour story promotion tactics of the organisers of Premier Vision, stating that twelve shades are promoted by the exhibitions own trend packages. The exhibitors are compulsorily obliged to include these colours in their own ranges. This observation has also confirmed verbally by (Roweth, 2000).
3.2.2 Subjectivity and objectivity.

(Kirby, 1994) pointed out that colour has two basic sides, that of science and objectivity coupled with those of more subjective and less tangible qualities. This would suggest that colour can be measured accurately in a mathematical approach with technology or discussed in a more obscure manner using less definable semantics.

(Sproles, 1979) viewed forecasting as ‘anticipating the timing of change, the direction of change and the pattern of consumer acceptance of the change.’ This is considered to be a fair analogy of the process, which he suggested to be both an art form and a science. Art consists of ‘good judgement. Intuition and past experience,’ i.e. knowledge stored in the conscious and subconscious mind. Science consisting of ‘analytical concepts and models, quantitative systematic basis,’ reiterated again by both (Tate, 1984) and (Sproles & Burns, 1994) acknowledged that the forecasters would have the world believe that the forecasting process is strictly an art, even a gift in an attempt to monopolise the profession.

It was then recognised that an ideal methodology would include a combination of tools from both the artistic and scientific approaches. Many of these tools were discussed and evaluated from the general forecasting methods available and those used specifically by fashion forecasters.

The apt statement below supports the concept of the process having two equally important attributes, art and science.

(Hann & Jackson, 1985) gave recognition to the belief of author Sproles, regarding the obstacle presented by the current forecasting collaboration and the influence it would appear to hold over the fashion and textile industry as a;

“….. mystique that forecasting is an art, a matter of intuition that requires a feel for the market. Particularly in predicting new trends, entrepreneurs view themselves more as gamblers than management scientists. Thus, when systematic research is proposed, many are sceptical. One frequent theme is that fashion is not susceptible to science, and that data are only historical and have no value for forecasting. Clearly the value of life cycle analysis has to be proven for specific application. But a more subtle problem must be confronted, the buyer’s or product manager’s desire to maintain his/her status and authority as expert judge and interpreter of trends.”
Undoubtedly, there appears to be a dominant view instigated by the forecasters that advocates the belief that the art of forecasting is an acquired one. A bid to protect their potentially dispensable businesses could discourage any hope of finding and disclosing a successful methodology of colour forecasting to be applied by the fibre, yarn and fabric manufacturing industry without the assistance of expensive forecasting services.

(Green, 1994) appeared sold upon the hypothesis put forward by the forecasting sector that the decision making process is purely subjective and could not be applied to a scientific based methodology.

3.2.3 Forecasting skills.

(Perna, 1987) recognised three key skills to be acquired by the forecaster and used as tools in the process of forecasting as awareness, insight and interpretation. These aspects are considered to be qualities of the art side of forecasting as opposed to the more objective, tangible and recordable science based qualities. She also deduced that the forecaster ‘delineates the possibilities, alternatives and the ‘dark horse’ using orderly thinking and guide posts to assist anticipation and the measurement of new trends.”

3.2.3.1 Awareness.

Edelkoort explained the forecasting process, emphasising the importance of awareness. She stated that colour forecasting is “…a continuous building process assessing aesthetic, sociological and philosophical movements and recognising patterns.” She claimed to observe these patterns through a number of sources including people on the streets and shops, through vintage clothing, i.e. using historical trend information. Also through advertisements, artistic friends and political developments including financial trends. All of these were described as part of the awareness process. She went on to state that all of this information is collected visually and stored in the memory, and later analysed and filtered into trends. In other words, a systematic approach is used but remains unrecorded for use by others. (Fearon, 1996)
3.2.3.2 Observation skills.

(Edelkoort, 1999) spoke of how intuition can be developed through the use of observation skills that continually absorb information from the environment. This is actually a forerunner of the awareness process. First we see the things around us within our environment, this is very much a subconscious act, and it is when we become aware of the information we have taken in that the data is brought into our consciousness. The forecaster trains to become more aware of what is observed, and this in turn makes more conscious use of observation. When initially selecting colours, the memory becomes an active part of the process. As more of the same colour is observed, the memory activates the recognition of patterns observed recently in the environment, this information is brought into the conscious mind, making the forecaster aware of these patterns. It is obvious therefore, that awareness and observation go hand in hand, but because this information is rarely recorded, it remains subjective and no one can dispute the data to be accurate or otherwise. There is also the problem regarding colour memory, how accurately one can recall a particular colour, this is further discussed in section 3.3.2.

3.2.3.3 Intuition.

(Edelkoort, 1999) was adamant that intuition is the key to successful colour forecasting and stressed its function in the process as being the most important tool. She recognised that intuition is of greater importance and the prime tool used when the forecaster comes to the part in the process where all the information is brought together into presentable and convincing colour stories. She also emphasised the important role that colour plays in the fashion business, stating that the industry in general, has been led to believe that when the colour aspect of design is right, then all else will fall into place. For this reason, companies are willing to invest large amounts of money, i.e. subscription fees, in hope that their business will survive. It would appear that these companies are investing heavily in other peoples’ intuition. Further more, the information users, i.e. the designers and buyers, are then expected to use their own intuition in order to select the best colours from the range for their own company’s use. If the forecasting process was better understood by the industry, costly subscription fees could be saved, and a more diverse selection of garments could be prevalent upon the high street. Intuition is further discussed in sections 5.7 to 5.7.4 and in 5.7.6.
3.2.4 Sourcing and collecting information.

(Jabanis, 1983) discussed the many avenues available for sourcing information for the development of predictive colour and style stories for a company's new season's collection. Though the reasoning or thought processes of why they were selected was not given. Further information regarding sourcing methods are further discussed in sections 3.2.7 to 3.2.7.3.

3.2.5 Analysis and evaluation of information.

(Jabanis, 1983) also discussed methods of evaluation and interpretation of information as well as the presentation of the data. Much of the discussion revolved around the in-house personnel of retail companies, though reference was given to fashion consultancies. A model of the evaluation process was given and shown below.

1. List all trends in order of importance.
2. Under each trend note the distinguishing characteristics:
   a) Leading silhouettes.
   b) Leading fabrics.
   c) Best colours and patterns.
   d) New combinations of colour, fabrics, patterns.
   e) Newest accessory treatments.
3. Designate the best timing for promoting each trend.

(Sproles, 1979) offered an interesting system for the analysis of the fashion process, where 8 stages were identified:

1. The fashion object — characteristics (lifecycles)
2. The functions of the object — this includes analysis of the needs of the consumer.
3. The environment the object is accepted in — external influences on consumer selection.
4. Communication of the information of the object — influences upon consumer decision making.
5. The Adopters — lifestyles and demographics.
6. The motivations of the adopters — social/psychological forces upon consumer decision making.
7. Level of acceptance of the object — fashion diffusion.
8. Dimensions of change as time passes — changes in 4, 5, 6 and 7.
3.2.6 Interpretation and presentation of data.

Interpretation requires a preliminary process of eliminating the information not considered to be applicable to the season or company profile, or to any other definable aspect. This process of elimination may be based on intuitive reasoning or a more objective and fundamental approach. The remaining data forms the colour story to be presented to the company's personnel. It is well noted that the presenter of the information has to be skilful in putting across the conviction of the story to the listeners, where confidence and persuasion prevails to communicating and portraying the right mood. The predictive presentation was discussed in much detail, highlighting the importance of research, refinement of the data, evaluation and the presentation of the information. (Jabanis, 1983)

3.2.7 Specific methods of forecasting.

(Sproles, 1979) spoke of two sets of principles of forecasting. The first being general and the second as more fashion specific, each were discussed in detail. (Sproles & Burns, 1994) also discussed these relevant forecasting methods specific to the fashion forecaster. These issues of interest are further discussed.

3.2.7.1 General forecasting methods.

The general forecasting methods are considered to be all of those of a scientific nature which can be recorded and analysed. These include researching the economy, demographics, technical developments and socio-cultural aspects. Each of these subjects has a different value of significance to each forecasting sector. Demographical trends are of little consequence to the initial colour forecasters who are predicting for a diverse clientele, such as both the apparel and the home furnishings industries. Demographic trends are however, generally important to specific market sectors such as women's knitwear manufacturers.
A noteworthy point by (Sproles & Burns, 1994) highlights the importance of awareness of these categories, with reference to the economy. During economical difficulties fashion has been found to be less of a necessity, classical styles and colours are more likely to be popular. On the other hand, during affluent economical periods, novelty is more likely to be accepted. This can logically be seen to greatly affect the acceptability of, and the changing proportions of staple colours and fashion colours, particularly fad colours. Similarly, technical developments such as dyeing techniques may provide an avenue for new colours, perhaps specific to certain fibres. The fibre and yarn producers would have a vested interest in having these particular shades popularised. General methods include changes in the national economy, demographic trends, technical developments, socio-cultural environment (lifestyles) all of which affects change in consumer demand. (Sproles, 1979)

3.2.7.2 Fashion specific forecasting methods.

Fashion specific forecasting methods include both artistic and scientific applications. The method of using historic data, linked with the controversial recognition and use of cycles is noted as important, though little used and possibly less accepted manner of fashion and colour forecasting. A systematic and analytical approach to the changes of colour in forecasts and the acceptability by the consumer may possibly be viewed as too large a task to be undertaken by forecast personnel or as a research topic. Few companies, if any may be willing to fund this type of extensive research. Its value could possibly be determined by reliable indications of how important colour precision is to the consumer first. If this is of great importance, the research could possibly be justified. (Sproles & Burns, 1994)

Fashion specific forecasting methods relate to aspects that include the history of fashion. (Sproles, 1979) suggested that forecasting could employ a study of the last five to ten years to assist forecasting trends for the immediate future. He claimed that cycles are more systematical to long run trends but not to the short run trends, known as fads. As far as colour is concerned, a study is still necessary to shed any real light upon this controversial concept.
Further fashion specific forecasting methods include the measurement of the diffusion of fashion, with the use of diffusion curves developed using the number of adopters over points of time. The rate of acceptance is analysed and also the current level of acceptance. The extent of the trend should be possible to estimate. The current level of acceptance is a technique that the forecaster observes, whether or not they are conscious of this fact. They prefer to view this technique as part of their intuition.

Consumer surveys, consumer panels, test marketing and the monitoring of designer collections, fashion cities and the high street are all sources of data collection which are considered to be fashion specific. Trends in consumer spending were also included. (Sproles, 1979)

3.2.7.3 Further specific forecasting approaches.

Other scientific approaches include measuring fashion diffusion, data collection from consumer surveys and panels, market testing, analysing sales trends, and consumer spending habits. In order to measure the diffusion of colour, a database of historical information is required. (Sproles & Burns, 1994)

(Brannon, 2000) put forward the idea that a mix of qualitative and quantitative forecasting methods potentially offers a more valuable method of forecasting and there is a necessity to use both long and short range techniques as a general basis. Predictions are then to be tailored to the specific consumer segment. This, she claimed, enables a more open-minded approach to a speciality area, eliminating possible confinement of ideas.

3.2.7.3.1 Quantitative methods.

Quantitative models were discussed by (Sproles & Burns, 1994) as methods of measurement and quantity. This can be interpreted scientifically using sales figures for consumer acceptability. Quantitative methods have been developed for consumer behaviour analysis, though not for fashion prediction. (Sproles, 1979) felt that this is an avenue that will eventually be applied to fashion forecasting.
Marketing techniques within the fashion sector have advanced much in the latter decades of the twentieth century and indeed the analysis of consumer behaviour is widely accepted as an important aspect of forecasting as the concept of lifestyles has progressively become a more integral part of the process. This was evident in recent publications such as (Brannon, 2000) and the (BBC video, 1991), The Colour Eye.

3.2.7.3.2 Qualitative methods.

(Sproles & Burns, 1994) also discussed qualitative models, these are concerned with quality and generally used in the form of observation skills by the fashion forecasters. Observation in this instance concerns itself with communications using the eyes and ears. However, with the lack of a precise verbal colour system, this method is somewhat fallible for the colour forecaster, knowledge of colour precision and acceptability are of paramount importance. (Sproles & Burns, 1994)

3.2.7.4 Long and short range forecasting methods.

Two types of forecasting were identified, short range and long range. The difference between the two are predominantly the time-scale involved and accuracy. Short range is the most accurate of the two due to its shorter time span, from a few months up to two years. Longer time spans of long range forecasts, three to five years, have a higher risk of inaccuracies due to unforeseen factors materialising later on. Short range forecasts are therefore more apt to forecasting fashion. Trends are identified and the levels of demand for them assessed as well as the timing of acceptability by the consumer. Long range forecasts are more apt to marketing strategies. (Sproles, 1979)

Due to the time required by the industry to produce garments and sell them to the retailers, the forecasters work around two years ahead. With the changing climate in the industry and producing orders on demand, a shorter time-scale could be employed by the manufacturers using their own forecasting process. Therefore, an even shorter time-scale could assist to further reduce inaccuracies that are unavoidably unforeseen using the present forecasting process.
3.2.8 The thought and decision making processes of forecasting.

(Jarnow & Dickerson, 1997) developed a useful list of thought processes for the forecaster regarding the past and future preferences of the consumer.

1. Careful observation of current events that have captured or are likely to capture the imagination of customers and affect the styles they will prefer.
2. Awareness of the current lifestyles and dress of those men and women most likely to influence what the firm's own customers will ultimately adopt.
3. Study the sales trends in various sections of the country, not only for the forecasters' own company, but for competing companies to whatever extent is possible.
4. An intimate knowledge of the fashion opinions of their sources of supply.
5. Familiarity of professional sources of information, such as fashion reporting services, fashion periodicals, opinions of consultants, analyses offered by resident buying offices and the like.
7. Understanding of and constant awareness of the inevitable and evolutionary nature of changes in fashion.

It would be interesting to know if this is an ideal, or whether it actually works in practice. It does suggest, however, a recipe to work from, that could be applied to colour forecasting for the manufacturing and retail industry.

(Worth, 2000) made a particular statement reinforcing the debate in the mind of the reader as to what is actually of greater importance, the act and result of prediction or the actual decision making policies and the result.

"Predicting colour and colour trends and making decisions about colour ranges for the season ahead is one component, perhaps the most important component of this prediction process."

As far as predicting trends is concerned, the engineering of the colour forecasting industry ensures to a degree that the colours predicted will prevail due to the marketing influences and techniques employed. A most important aspect considered by the reader is the actual decision making process. As colours are said to evolve, how it is decided which way the colours will evolve and is this a conscious decision. (Worth, 2000) recognised this point of question, but did not investigate the problem.
As previously discussed in section 3.2.1, Edelkoort explained the outline process of colour selection, but did not elaborate upon what the underlying thought processes are or how the brain works using previous knowledge obtained.

Also previously mentioned in section 3.2.1, (Hulse, 1997) Joanna Bowering explained the overall forecasting methodology, but failed to throw light upon where the initial inspiration comes from, or to what extent, if any, the subconscious mind contributes to the underlying thought process.

The (BBC video, 1991) The Colour Eye, offered a potential opportunity to witness the thought processes discussed during the recording of the decision making processes. Though it was obviously edited due to the running time of the video in relation to the time necessary to complete the task, and therefore the actual thought processes were not recorded.

3.3 The importance of colour precision and colour communication.

(Benson, 1999) reported that “Rapid accurate colour communication was regarded as a potential key contribution to improving both the process of colour forecasting, and its wider use.” (Green, 1994) also recognised the importance of future technology and colour communication development, but neither author elaborated upon this issue.

Developments in technology and communication were reported to have diminished the necessity for numerous forecasting studios to be located around the world. The advantage being that of reducing costs for companies. (Merrett, 1997) This could account for the demise of some studios such as Design Intelligence, London, in recent years.

(Frings, 1991) fuelled the question of accuracy and precision conducted by the colour and fashion prediction services, stating that in depth information was reported to their respective clients approximately one week after the trade exhibition. While it can be appreciated that fashion styles and details can be accurately interpreted in a relatively short space of time, it may be questionable whether or not this time span is sufficient enough for the accuracy of colour reproduction.
No evidence was found regarding the methods used for colour measurement by these reporters, or the accuracy of the colour information reported back to the design offices, question marking the reporters' interpretation skills. Likewise, no information was found regarding the accuracy of the reproduced colours to the originals at the trade exhibitions.

3.3.1 Colour names, semantics and communication

While the generic names of colours narrows down the spectrum of a hue’s intensity and value, they do not actually communicate the precise colour in one’s mind. If personnel communicate, in verbal terms from their observations at trade fairs to the designers back at the office, drastic colour differences will prevail. (Perna, 1987) stated that CAUS standard colour reference of America is often used as a colour communicator, but how universal this or any similar system is used was not suggested.

(Edelkoort, 1999) stated that colour names were beginning to develop an importance in forecasting. She mentioned that some in the field of science and colour perception regard the possibility of humans' developing colour perception over the generations. This was suggested in terms of the continuing development of the cones and rods within the eye and the messages they send to the brain. Though no scientific evidence was given to back up this claim.

(Brannon, 2000) gave reference to the use of colour names as a marketing tool. Stating that colour names can be used to represent a mood, add freshness to a range and up date an otherwise dated colour.

The following quotation reiterates the importance of colour names and colour precision,

“When reporting or discussing colour, it is absolutely mandatory to be accurate about its value and intensity. It is not just Blue — is it Bristol Blue, Cornflower, French, Royal, Azure, Blueberry or Ink? It is not just Pink — is it Blush, Rose, Peachy, Shocking or Geranium? It is not just Beige — is it Ivory, Sand or Cream?.... and so on.”

This leads to the question of how accurately the semantics used by colour reporters for example for trade magazines, convey the colour story to the industry and how precise this information needs to be. The previous quotation stresses the need for more information to be given than just the hue, but cornflower blue and rosy are still not precise enough to convey the same colour to the minds of two or more individuals. This aspect was further identified and investigated through a questionnaire exercise discussed later in section 4.6.3.1.

3.3.2 Colour memory and colour communication.

Forecasters are renowned for keeping their methodology in their heads, relying upon the memory. This is of no use to the researcher or new comer to the profession. (Fiore & Kimle, 1997) suggested a need for a systematic approach. That is, a recorded system that identifies the process of change over time for future use. While such a system does not exist currently, the forecasters have a monopoly over the industry. This is further accentuated by the following quotation,

"Good instinct is something that you really have to have, you can't learn it. A forecaster needs a good eye for colour, the ability to see fine differentiation's in colour, shades and intensities. A forecaster needs a good colour memory, where one can look at a shade and almost be able to match something to the shade that is only a picture in one's mind. Not everyone has a good colour memory."

(Fiore & Kimle, 1997) Page 309.

Clearly the statement exaggerates the skills required of a good colour forecaster. Good instinct can be developed over time working in the field, as the appreciation and application of colour is employed. This claim was supported by (Edelkoort, 1999).

The following two statements given by (Brannon, 2000) reiterate the problems encountered by the limitations of the Human ability to recall specific colours.

"Most people can not remember a specific colour for more than a few seconds or pick out a particular shade when presented with several alternatives."

Page 119.
The Human eye can discern 350,000 colours, but the Human memory for colour is poor. Most people cannot remember a specific colour for more than a few seconds.

Therefore there would appear to be a great need for the use of a colour system to be used by the forecasters to accurately match colours from the initial source, unless the initial source is used only as an inspiration and not as the actual colour requirement.

3.4 Colour movement and rate of change.

(Hann & Jackson, 1985) referred to the necessity for ascertaining the methodology of the actual movement of colour change from season to season to assist the fibre, yarn and fabric manufacturers to establish a worthwhile approach to colour forecasting for themselves.

A potentially important statement was made by (Kirby, 1994) regarding the fact that people do not replace the entire contents of their wardrobes seasonally. The next season’s colours need to harmonise with those of the previous season, otherwise purchases would be discouraged on the grounds of having nothing to mix and match with. Commercially, colours need to change enough to add freshness to the new season’s garments and create sales, but slowly enough to allow for affordable replenishment of the wardrobe.

(Green, 1994) quoted Margaret Walch, Body Fashion/ Intimate Apparel, December 1983.

"CAUS colour predictions for purple.... The volume came in basic purple and fanned out into lilacs and over into plums, burgundies, and clarets. That's the way it often happens - a colour appears in its obvious form and spins off in related colour directions."

No evidence was found that clearly states whether or not colour forecasters apply this approach to forecasting either consciously or otherwise.
3.4.1 Colour cycles.

(Brannon, 2000) discussed cycles as having a fixed, regular periodicity and that no fixed, regular recurring cycles have been identified in fashion.

Two aspects of colour cycles were recognised; movement of colour preference and repetition of popularity of specific colours. Brannon suggested that the driving force for the former is boredom. She claimed that colour cycles can be accurately charted from the first colour forecasts of 1917 to present day. However, how do the forecasts compare with the popular colours that were actually worn at the time, and do these colour cycles still apply today.

She claimed that researchers had found swings from high chroma (bright) colours to multi-coloured, to subdued, to earth tones, to achromatics, to purple phases, back to high chroma hues; and that a seven year period is identifiable between cool and warm tones. She recognised cycles as being based upon hue, intensity and colour temperature, and that 'subtle differences and colour evolution are the tools of the colour forecaster.'

Michelle Lamb proclaimed the notion that colour cycles typically have an approximate time span of five years. This time span, however is recognisably changing, as supported by the following statement.

"What has changed over the past several years is the amount of time that it takes a trend to move beyond the high end. That cycle is speeding up somewhat. So the curve (dynamic bell curve) itself doesn't seem to be shortening, but it is compressing a bit in the early stages."

(Linton, 1994) Page 63.

Leonhard Oberascher also discussed colour cycles but from an architectural point of view. Cycles in this field have been identified to last around a twenty five year period. Each cycle is said to have started with high chromatic colours and multi-colouredness, moving to subdued colours, earth tones, and then achromatics before returning back to high chroma hues.

Another area studied for colour cycles was discussed using cover pages of a German interior magazine. Over a twenty year period the following sequence was apparently identified. High chromatic, multi-colouredness, darker colours, earth tones, lighter colours, white, achromatics, high chroma hues introduced, purples and more high chroma hues to begin the cycle again.
"A model of cyclic recurrence of colour preferences, therefore, seems to be possible. As in all probability, a cyclic recurrence of colour trends follows the pattern described in this article, this can form the basis for long-term forecasts of colour preference that can be useful in designing new products."

(Linton, 1994) Page 76.

"Another reason why selecting the ‘right’ colours will remain a crucial task is that even if it is likely that a group of people will adopt new colour trends, a cyclic recurrence of colour preferences does not imply that colours are reinterpreted and used the same way that they were interpreted and used before."

(Linton, 1994) Page 76.

Kenneth X. Charbonneau also discussed colour cycles. He spoke of the ‘avocado years’ during which time avocado, harvest gold and coppertone were used throughout the product industry. These colours then evolved into earth tones with a green bias, then moving into chocolate brown. The oranges of the avocado years moved to terracotta and other warm earth tones. Eventually colour moved to pastels including peaches, pinks, pale blues, greens, ivories, creams, then grey replaced brown, introducing subdued rose and mauve. (Linton, 1994)

(Hann & Jackson, 1985) evaluated fashion trends and fashion cycles with emphasis upon the ‘reasons for clothing choices’, consumer behaviour, and physical and psychological satisfaction. Discussion of the fashion life cycle, much referred to in fashion literature, was found to be a ‘concept not universally accepted’ and that a preferable terminology by the marketing profession was ‘product life cycle’. Knowledge of cycles was suggested to be an ‘important concept in fashion analysis and forecasting’, and defined as ‘variations over time in the volume of sales’. However, the validity of this concept as an ‘effective tool’ has been challenged by many authors and this is evident within the discussion of the paper.

(Frings, 1991) stated that ‘colour specialists try to analyse colour cycles and the natural evolution of colour preferences.’ To date, evidence of personnel within the prediction services analysing the actual movement and repetitiveness of colour over time is severely lacking. Few investigations of this nature have been conducted in the educational sector. Still no clear methodology for the movement of fashion colours for the purpose of understanding the colour forecasting process has been recorded.
(Sproles & Burns, 1994) discussed the controversial subject of fashion life cycles as a ‘constructive analytical tool for the fashion entrepreneur.’ The diffusion of fashion occupies a large portion of the book with particular concern to the consumer and the psychological implications involved in fashion acceptance and purchase.

(Green, 1994) stated that,

‘typically, we see trends in colour and pattern as moving along a dynamic bell curve that represents about a 5 year cycle from the first time we see it until the moment it’s gone…. The strongest colour resurgence occurs in 20 – 30 year cycles.’

However, no factual evidence was shown to have been used to support this claim.

USA graphic designer, James Stockton was quoted by (Buddy, 1992) as having believed that ‘Colour trends are very perceptible and they attach themselves indelibly to eras, products and fashions.’ It could be construed that in previous eras colour was used as a back drop to style. Today, colour is becoming more of a focal point as a driving force of fashion and purchases. To prove this one way or the other, an in depth research project would need to be undertaken. Interestingly, ‘colour moods moving in cycles’ was referred to as opposed to individual colours moving in cycles.

(Jabanis, 1983) also gave mention to colour cycles, particularly in terms of revivals, where history is used as inspiration for new styles. Recognition was given to cycles existing due to the inspirational context and not as a rigid cyclic pattern. Therefore a recipe for a prediction methodology can not be attached directly to fashion history. This appears to be the conflicting aspect. It is most likely the communication of the concept that is disagreeable as opposed to the conceptual theory.

(Edelkoort, 1999) also believed that colour patterns can be and indeed are cyclic in the manner of been ‘in fashion’, then ‘out of fashion’, though no formula or set pattern exists, in terms of rate of change or direction of change. (Fiore & Kimle, 1997) referred to colours as ‘slow changing from season to season or year to year.’ Giving recognition also to the concept of the value of ‘direction and rate of change for forecasting fashion trends.’
3.4.2 Staple colours and fashion colours.

An interesting quotation by (Green, 1994) originated from The Times – California, dated September 18th, 1928.

“Style Arbitors say Blue is to be the 1929 Colour. 
.... Colours are going to be made to run in cycles, so that every 5 or 6 years blue will create a furor, with green, grey, beige, red and brown favoured other years. The standardisation of the trade's demands will help dye makers materially and add to their riches because it means they will be able to concentrate their efforts on few rather than many colours each year.”

While it would make some sense to the dyeing industry to operate in this manner to run cost effectively, in reality the change of colour from year to year would be too quick for effective benefit to the retailer. However, it appears that at least some of the afore mentioned colours have become acceptably adopted by the colour forecasting industry as 'staple colours', used to anchor 'fashion colours' to from season to season, though the rate of change of the staple colours is more than one year. Investigation of the rate of change of specific trend information is required to substantiate this claim.

3.5 Decision making thought processes of the consumer.

According to Nelly Rodi (Merrett, 1997), The process of forecasting has become a more complex procedure during the last decade than it had been during the two decades previous. Stating that the consumer needs of the 1970's were never really identified and targeted, neither were developments in technology taken seriously into account. She described the process of the earlier years as 'one dimensional'.

During the 1980's, she claimed that companies were working more sympathetically with sociologists and taking more notice of the consumer in terms of identification and needs. It was reported that twelve types of female consumers had been identified at this time. Over one thousand are now reputed to be identifiable. Due to the complexity of the nature of forecasting today, many companies find it cost effective to pay design consultants and forecasters to develop a working methodology for their benefit.
(Sproles & Burns, 1994) suggested that 'no method of forecasting is foolproof; with the combined general and fashion specific principles for forecasting, the analyst can construct a broadly valid estimate of future consumer behaviour.'

(Benson, 1999) briefly explained the principle effect of the psychology of colour upon the consumer. However, how many of us consider these implications while purchasing a new garment?

(Buddy, 1992) stated colour, feel then price to be the recipe of the consumer's purchase decision making process. It may be more appropriate to use the more general terms; aesthetics, tactility and value. She invited the co-operation of a store to assist in an experiment to prove the above conceptual statement. The results showed '30% better sales by colour', though no explanation of the colours used or the theory behind the concept was given.

3.6 Validity of information.

It was found that much of the factual information was regurgitated from text to text. This can be substantiated by comparisons of the bibliographies. Unfortunately, there is at present little available on this subject, most authors discussed colour forecasting within only one chapter, therefore their research of the subject had not gone beyond that of previous texts.

3.6.1 Lack of supporting evidence.

It would appear that due to the lack of diverse information sources available, authors have had a tendency to incorporate their own opinions without giving any clear supporting evidence, in other words, they appear to be drawing their own conclusions. An example of this was found on page 50 of (Kirby, 1994) when referring to certain values of colour traditionally associated with the particular seasons; such as pastels for spring. No reference was given to its source and it is therefore considered to be speculation on the author's part. Observation of the high street did not confirm or support this claim to be correct.
(Green, 1994) when discussing the future of forecasting concluded that 'the fashion industry has not developed a truly systematic and formulated way of constructing colour prediction and evidence suggests that this is not an appropriate approach.' While the first part of the statement is based upon fact, the so called 'evidence' that was to support the claim in the latter part of the statement was not identified.

The following statement made by (Healey, 1984-5) throws doubt upon the validity of some of what must be assumed to be the author's own opinion as no reference of source was evident.

"A certain mystique seems to cloud the general public's perception of colour and it is common belief that a solitary person sits in a room of rainbow colours picking out particular colours for esoteric reasons to pass on to the textile world."

When discussing the subject of colour forecasting in the company of persons with no formal fashion knowledge, many have shown surprise that such a service or industry exists. They did not realise that colours were even considered in the product planning stages, let alone forecast some two years ahead of a season. This reaction made one wonder whether a colour story promoted on the high street is actually recognised consciously or otherwise by the general public. If not, there is no mystery as to why there is little curiosity as to how colours are selected by the high street stores for the consumer.

Another statement from (Healey, 1984-5) also questions the validity of the information given, due to the lack of supporting evidence.

"Although in the UK the colour consultant has nearly always worked independently, relying to some extent on informal guesswork, there are now coordinating bodies at both national and international levels which provide colour forecasts for the fashion industry."

One notable sentence given by (Diamond & Diamond, 1997) pretentiously implies that colours drastically change seasonally and that colour precision is without compromise.

"The colours are brand new each and every season, meticulously dyed and re-dyed until they meet the exacting specifications of the colour specialists."

Page 361.
It is not commercially viable, nor feasible for any company within the fashion and textile industry to invest time and money on such an extravagant process and therefore the statement is considered invalid, or at best, misinforming.

3.6.2 Outdated information.

(Benson, 1999) referred to a London based forecasting company, Design Intelligence. The company ceased trading in London circa 1997/8. This highlights that care is needed by the reader to establish the continued existence of particular companies when using them as references, to keep the information valid and contextual.

3.6.3 Primary research.

The methodology described by (Benson, 1999) did not suggest that in depth research at primary level had been undertaken. The results were obtained from only ten respondents for analysis from five different market sectors, indicating an average of two respondents per sector. Past teaching has always suggested a preference of a minimum of thirty respondents for any sector for moderate accuracy in analysis. Any information based upon this author's own primary research might be subject to a degree of bias and inaccuracy.

(Kirby, 1994) 'Analysis of colour forecasting within the UK textile industry, 1993.' This chapter consisted of results obtained from a questionnaire designed by the author. 160 questionnaires were claimed to be dispatched wide spread throughout the industry, 92 were returned. However, the distribution of the questionnaires could be considered to be too wide spread. Responding companies included fibre producers, yarn manufacturers, fabric manufacturers, garment manufacturers, designers, retailers and a somewhat indistinct category referred to as 'other'. No explanation was offered to clarify the identity of who the 'other' respondents were or the nature of their business. Had 92 respondents replied from the women's apparel manufacturing sector, more conclusive and valuable results may have prevailed. The fibre, yarn and fabric manufacturers most likely supply a wider clientele than just the women's wear industry.
The largest number of respondents in any sector was twenty, the yarn manufacturers. The lowest was three, the fibre producers. Valid results cannot be considered to be obtainable by such biased data. Sixteen respondents were classed as 'other'.

3.7 Summary.

A vague depth of knowledge appeared to be evident regarding the methodology of colour forecasting apparent from the findings of this chapter, also its application within the industry was found to be somewhat ambiguous. While it is generally accepted that the process is both subjective (artistic) and objective (scientific), there is still a lack of in depth information recorded with regard to understanding the underlying principles.

The whole purpose of colour and fashion forecasting is to enable the industry to manufacture products that will be in demand by the consumer at a given period of time. Meeting this demand ensures the existence and ideally, the profitability of the fashion and textile industry. However, if this demand is not being met, then the process of forecasting is failing both the industry and the economy.

The key element for investigation focuses upon the decision making processes or thought patterns that will give depth to the collective body of knowledge of the forecasting process, and to discover how colour forecasting is, meeting consumer demand, if at all.

An investigation of suitable methodologies to produce working models of the process will be conducted in the chapters that follow.

In the following chapter colour terminology is made clear to the reader and the current level of colour knowledge is also investigated.
4.

Colour Knowledge.
In section 3.2 it was recognised that hue, intensity and value were the three fundamental aspects of colour considered relevant to colour forecasting. Colour temperature was also found to be of great importance. It was therefore considered prudent at this stage to define these aspects in more detail in order to set the foundations for the reader, prior to progressing into more in depth research.

4.1 Hue:

Hue is simply the terminology used that gives a name to an actual colour, i.e. red, yellow, blue. Hue gives no indication of the exact colour, only the family name that the colour belongs to. Other generic names used include pink, brown, turquoise and magenta. Pink belongs to the red family, warm browns belong to the orange family. Turquoise and magenta are generally recognised as tertiary colours. However, the exact colour can not be interpreted from the generic names alone, nor without basic colour knowledge can one determine the composite colour combination of a particular hue. Here lies one of the problems that colour communication presents to all those involved in the field of colour and its application. As highlighted in section 3.2, many colour forecasters are now reporting that the actual hue is of less importance than the intensity, value and colour temperature aspects of colour. Though hue appears to be a prime factor of staple and fashion colours for a season.

4.1.1 The twelve hue colour wheel.

The twelve hue colour wheel is a basic colour tool. It comprises of three primary colours, three secondary colours and six tertiary colours. The primary colours are red, yellow and blue. These colours are 100% pure hue and called primary colours as they can not be produced by the mixing of other coloured pigments, they are obtained from natural primary sources.
The three primary colours are evenly spaced around the colour wheel, shown below in figure 2.

![Diagram of a colour wheel with three primary colours: red, yellow, and blue. The secondary colours are shown as combinations of the primary colours.](image)

*Figure 2.* The three primary colours on a twelve hue colour wheel.

The secondary colours are orange, green and violet. These colours contain equal amounts of two primary colours. Orange is made by mixing equal amounts of red and yellow. Green is a mix of yellow and blue, and violet is made of blue and red. This is demonstrated in figure 3 below, the figure also shows the secondary and primary colours on the twelve hue colour wheel.

![Diagram of secondary colours on the colour wheel. Orange is made of 50% red and 50% yellow. Green is made of 50% yellow and 50% blue. Violet is made of 50% blue and 50% red.](image)

*Figure 3.* Primary and secondary colours on the twelve hue colour wheel, and the composition of the secondary colours.

The addition of the six tertiary colours completes the twelve hue colour wheel. These are red/orange, orange/yellow, yellow/green, green/blue, blue/violet and violet/red.
Each tertiary colour is made up of one primary colour and one neighbouring secondary colour on the colour wheel. As each secondary colour is made up of a 50/50 mix of two primary colours, a tertiary colour is therefore made up of a total of 75% of one primary colour and 25% of another. This is true when the mid way colour is the representative, as on the twelve hue colour wheel, however many combinations are possible that lie between each colour on the colour wheel. Figure 4 below shows the simplified compositions of the tertiary colours and the full twelve hue colour wheel, where the points of the hexagram point to the tertiary colours.

\[
\begin{align*}
\text{Orange} & = 50\% + 50\% \\
\text{Yellow} & = 50\% + 50\% \\
\text{Green} & = 50\% + 50\% \\
\text{Blue} & = 50\% + 50\% \\
\text{Violet} & = 50\% + 50\% \\
\text{Red} & = 50\% + 50\%
\end{align*}
\]

*Figure 4.* The twelve hue colour wheel and the composition of the tertiary colours.

In reality, a tertiary colour can be made up of any combination of primary colour plus a secondary colour. There are generic names that are generally used for all of the tertiary colours, with the exception of red/orange, which may be referred to as scarlet or salmon or any other given name in accordance with fashion trends or personal perception. Generic names for the tertiary colours are shown below in figure 5. There are more divisions between each of the twelve hues shown here.

*Figure 5.* Tertiary colours and the generic names.
The twelve hue colour wheel is generally accepted as a simplified, workable tool. In the previous chapter it was found to be common for colour names to be used to set the mood for a colour story. These names may be reused for a different season applied to a slightly different hue, or the same hue may be given an updated generic name, as discussed in section 3.3.1.

4.2 Intensity.

Intensity refers to the strength of a colour. This may also be referred to as a colour’s saturation or brightness. That is to say that a pure hue can be fully saturated or less saturated without altering the actual hue only its strength. Another important factor to be considered here is the reflectance of light from different fibres, yarns and fabrics. Fibres with high lustre such as silk and many man made fibres that imitate the characteristics of silk give the perception of full saturation, whereas opaque fibres such as wool are generally perceived as colours with less saturation. Developments and advancements in the dyeing and finishing industry challenged this aspect to obtain stronger, brighter colours on opaque fibres such as wool. Without the ability to achieve this, certain fibres would become unpopular during times of certain colour trends. Saturation of the colour red is demonstrated in figure 6 below. The less saturated red may be perceived by the viewer as a red/orange. This emphasises the problems encountered by those working in the field of colour.

![Pure Red, Fully Saturated.](image1)  ![Pure Red, Less Saturated.](image2)

Figure 6. Demonstrating colour saturation.

4.3 Value.

The value of a colour refers to its clarity or purity. Pure colours have no added white, black, or white and black combined, i.e. grey. Pure colours are often termed as brights, colours with an added amount of white are known as tints. Colours with an added amount of black are known as shades and colours with an added amount of grey are known as tones. Many variations of a hue can be achieved by altering the value, this is therefore an important aspect for the colour forecaster to consider and work with.

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Each of the primary, secondary and tertiary colours can be altered in terms of its value according to the percentage of tonal value added. Values alone can be used as colours with no added hue, these are known as achromatics, the generic names are white, grey and black. Grey may be of any white and black combination, fashion names are often given such as slate and silver. Figure 7 below demonstrates the values tints, tones and shades.

![Colour Triangle Diagram]

*Figure 7. A variation of the colour triangle, figure 12.1 (Danger, 1987)*

Tones may be light, moderate or dark, dependent upon the amounts of black and white used. Larger quantities of white to black produce lighter tones than tones that contain more black than white. Equal amounts of white and black produce more moderate tones. Figure 8 below shows the colour blue superimposed into figure 7 above.

![Blue Colour Triangle Diagram]

*Figure 8. Blue as pure colour, a tint, a tone and a shade.*
There are few generic names for tints, tones and shades of hues, some that are used include navy (blue shade), burgundy (red shade), pink (red tint), peach (orange tint), khaki (yellow tone). Tints are often referred to as pastels, they create lighter weight colours than tones and shades. Tones are often referred to as muted colours, light tones appear misty, dark tones also appear misty but heavier than light tones. Shades appear heavier than the other values and are sometimes referred to as darks, or dark colours. These colours are often rich in appearance and may also be referred to as such. There appears to be no specific tool used for the identification of these variations of value commonly used by the forecasters, though one such system was devised by (Danger, 1987) of which a variation has been produced in figure 9 below.

![Figure 9. Variation of (Danger, 1987) figure 12.2, Key to colour description.](image-url)
4.4 Colour temperature.

There is a general acceptance that the hues red, orange and yellow are warm and that green, blue and violet are cool hues. Red is generally considered to be warmer than yellow and blue is reputed to be the coolest of the pure hues. Figure 10 below shows the warm and cool hues of the twelve hue colour wheel.

![Diagram of the twelve hue colour wheel with warm and cool halves indicated.]

*Figure 10. Warm and cool colours on the twelve hue colour wheel.*

4.4.1 Undertones.

Each hue has an undertone, this is the underlying primary colour. It is the undertone of a hue that determines the temperature bias. A blue undertone gives a hue a cool bias and red undertones give a hue a warm bias. Each hue can have either a warm or a cool undertone regardless of the actual hue. Therefore blue while being a cool colour in general, can have a warm bias if the undertone is red. This is also true of the warm hue red, if there is a blue undertone then the resulting red is cool. Consequently each primary hue can have a warm and a cool variation.
If two primary colours with a warm bias are combined, a warm biased secondary colour will result. Similarly, if two primary colours with a cool bias are mixed, a secondary colour with a cool bias will result. However mixing colours with a different colour temperature bias will result in a more temperate secondary colour. Figure 11 below shows the colour bias of secondary colours produced from warm and cool biased primary colours.

Figure 11. Demonstrating the mixing of secondary colours with different colour biases.
Figure 11, on the previous page, shows secondary hues having a cool, warm or temperate colour temperature bias. In principle, the combination of two warm primaries will result in a warm secondary hue. Likewise, two cool primaries mixed together results in a cool secondary hue, and a cool and a warm primary hue mixed will result in a more temperate secondary hue. This theory is a generalisation, the resultant colour temperature of the hue would depend in reality upon the percentage of warm hue and cool hue biases of the undertones.

4.5 Neutrals.

Neutrals, or neutral colours, are sometimes referred to as earth tones. Each neutral is a combination of all three primary colours of any percentage. As with any other hue, the dominant undertone will determine the colour temperature. Neutrals are often muddy in appearance, this is because in principle mixing colour complementaries actually cancels each other out. Theoretically, this cancellation should produce non-colour, i.e. black, in reality because colours are not 100% pure, but contain some impurities the result is not black but a dirty nondescript colour. For instance, a neutral may be made by mixing orange and blue, two complementary colours (opposite colours on the colour wheel), orange is made up of the two primary colours red and yellow, blue is the third primary colour. The result of mixing these two colours would be a neutral of some kind, but the actual resulting colour will depend upon the amounts of each primary in the mix. Figure 12 below shows the difference in hue between a neutral colour made by mixing all three primary colours and a brown that some may confuse as a neutral that is in actual fact a shade of orange, i.e. red + yellow + black.

![Neutral. Orange Shade.](image)

Figure 12. Demonstrating the difference between a neutral colour and a brown (orange shade).

As with pure hues, achromatic values can also be added to a neutral producing more variations of colour. However as neutrals are by nature muddy in appearance and greys and white are somewhat misty, the addition of these values may not produce very appealing colours, particularly for fashion apparel.
4.6 Level of colour knowledge in education.

There came a point in the research process when the level of colour knowledge within the colour forecasting profession became questionable. There are few courses, or modules within courses in higher education, particularly in the area of fashion, that prepare students for working within the specialist forecasting sector. Colour forecasters can come from a diverse educational background such as fashion, textile or product design, and/or manufacture or even from the sales marketing field. It was felt that probing the level of colour knowledge from the colour forecasters would be somewhat impertinent and would most likely result in a rather evasive assessment. An alternative course of action could be to try to gauge the level of knowledge of students studying university degrees from relevant courses that could lead those students into the forecasting sector at some point in their future careers.

A sample of 76 students of which 46 were undergraduates and 30 were postgraduates from various textile and design based disciplines responded to a questionnaire designed to gather information on three main aspects. The first aspect was to establish the level of students basic understanding of the role and importance of the colour forecasting industry. The second aspect was to establish the level of importance of colour to the respondent in relation to their fashion purchases, and finally the third aspect was to establish the level of the students colour knowledge.

4.6.1 The understanding of the role and importance of colour forecasting.

Respondents were asked to indicate from a given list, the period in time when they thought that colour forecasting had become a necessity to the industry. The options given were as follows,

<table>
<thead>
<tr>
<th>Pre 1700</th>
<th>Early 1700's</th>
<th>Mid 1700's</th>
<th>Late 1700's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early 1800's</td>
<td>Mid 1800's</td>
<td>Late 1800's</td>
<td></td>
</tr>
<tr>
<td>Early 1900's</td>
<td>Mid 1900's</td>
<td>Late 1900's</td>
<td></td>
</tr>
</tbody>
</table>

Research in the previous chapter indicated that forecasting became an activity of the fashion manufacturing industry during the early 1800's. By the mid nineteenth century, department stores were introduced as a new marketing concept, the man made fibre industry was established and the first fashion trade exhibitions were initiated.
By the early part of the twentieth century, ready to wear garments were more readily available and the boutique appeared, further advancing the marketing of fashion. Important colour forecasting services established at this time, first in the USA, circa 1927, then later in Britain, circa 1931. Advances in technology during the 1960's and 70's increased the industry's potential for sales during a more affluent economic period after World War II. Consumer demand however, was not well anticipated and added to other problems faced by the manufacturing industry at this time. While there is no hard and fast answer to this question it was interesting to find that 79% of respondents thought that colour forecasting became important from 1800 onwards, with 40.8% of respondents selecting the periods during the 1800's and 38.2% from the 1900's.

The highest percentage of any of the given periods was the early 1900's, 18.4%. This was the period of time when the first colour forecasting services were founded, strangely this was more evident from undergraduate students than postgraduates. This could be accounted by the fact that the postgraduates were mixed disciplines whereas the undergraduates were either fashion or textile students. During the mid 1900's many more forecasting companies were established, only 7.9% of respondents thought this period was of any significance.

89.5% of respondents felt that colour forecasting was very important to the industry, 15% felt it was fairly important and 2.6% felt it was not very important. Respondents were invited to give reason for this importance. An open question of this type encourages many interpretations of thought that can often be difficult for the analyst to extract meaningful information. 13.2% of respondents did not give an answer at all. Three basic divisions were made for those answers given, though there was some cross over on many of the answers given, these three basic categories were identified as;

1) For the benefit of the manufacturing industry to produce saleable goods. 25%
2) To determine trends for given seasons. 31.6%
3) Retail sales and meeting consumer demand. 27.6%

While some respondents indicated that they felt colour to be purely a driving force for sales, many suggested links between colour and consumer demand. For colour to be a driving force of fashion may be considered to indicate the presumption of the public only buying colours that are considered fashionable, whereas colour meeting consumer demand may suggest that personal preferences are the important purchasing factor. The latter would incorporate a more complex forecasting methodology than the former.
It was established in Chapter 3, that as consumer demand has become a dominant driving force of the fashion industry particularly from the latter part of the twentieth century, the methodology of fashion forecasting has indeed become a more complex process. This was reinforced by the results of the second section of the questionnaire.

4.6.2 The level of importance of colour in relation to fashion purchases.

Respondents were asked to indicate how important they felt colour forecasting to be to the fashion and textile industry. The three options were; not very important, fairly important and very important. Respondents were offered the opportunity to state why they felt it was of any importance. Respondents were also asked if they consciously follow fashion trends, always, sometimes or never, and if they would wear a colour purely because it was fashionable at the time and whether or not they would wear a colour that was not considered to be fashionable at that time.

77.6% of respondents felt that colour was a very important aspect when purchasing clothing. 19.7% felt that colour was fairly important and only 2.6% felt that colour was not a very important consideration.

17.1% of respondents claimed to always consciously follow fashion trends, 81.6% claimed to only sometimes follow trends and only 1.3% claimed never to follow trends. This could be considered to emphasise the fact that many people wish to be considered as fashionable in their attire, but does this mean that the general public will be dictated to by fashion.

Only 27.6% of respondents claimed that they would wear a colour purely because it was currently fashionable. 85.5% confirmed that they would wear a colour that was not currently fashionable. This finding could be considered to give strength to the importance of colour meeting consumer demand, as colours considered fashionable were not always preferred and non-fashion colours would be worn instead.
The results of this section of the questionnaire would indicate that colour is considered an important aspect in the process of selecting garments, but it is personal taste that prevails over being dictated to by the designers of fashion. This stresses the importance of colour forecasting reflecting consumer demand within all sectors and marketing niches of the industry. Therefore successful colour forecasting must reflect the consumers preferences, and that the collection and use of this type of information could be an advantage to the colour forecasting process and to its users.

4.6.3 Level of colour knowledge - The results.

Respondents were asked to indicate their understanding of colour theories and the principles of the colour wheel. Both questions were asked directly with a yes/ no response, therefore there was no explanation of what was specifically meant by their understanding, nor was their degree of understanding asked for. Colour theories can simply be concepts of harmonious and discordant colour combination applications or can be interpreted as more involved to include colour order systems. The principle of the colour wheel is a basic tool for the understanding of how colours are produced. This incorporates understanding primary, secondary and tertiary colours and how they are derived. This could be seen as a very basic theory presumed to be taught within primary or secondary school education art classes. Yet while talking to textile degree students about colour forecasting, it became worryingly evident that some students were not confident with their basic knowledge of colour or even more concerning, were unknowledgeable.

Only 50% of respondents claimed to understand colour theories, and 72.4% claimed to understand the colour wheel. Only 44.7% claimed to understand both colour theories and the colour wheel, 67.6% of which were postgraduate students. Two of these respondents were not completely confident of their understanding of colour theories, indicated by the addition of 'ish' next to their choice.

23.7% of respondents claimed to understand the colour wheel but not colour theory. One of these respondents was uncertain about the colour wheel, again indicated by the addition of 'ish'. 88.9% of these respondents were undergraduate students.
6.6% of respondents claimed to understand colour theories but not the colour wheel. This would indicate that the respondents were confident in putting colour combinations together but not understanding how colours are produced. 40% of these respondents were postgraduates.

A concerning 18.4% of respondents claimed not to understand either the colour wheel or colour theory. 85.7% of these respondents were undergraduates.

6.6% of respondents did not answer the colour theory question, but claimed to understand the colour wheel. This could increase the percentage of respondents understanding the wheel but not the theory from 23.7% as above to 30.3%.

Respondents were also asked if they considered colour knowledge to be an important factor for their course of study, and were asked to indicate their course or discipline in the case of postgraduate students.

4% believed that colour knowledge was not a prerequisite of their course. Two of these three respondents had indicated that they neither understood colour theory nor the colour wheel. Both were postgraduate students, one was not from a fashion or design background. The undergraduate respondent claimed to understand both the colour wheel and colour theory, even though studying a textile course, this student did not relate colour knowledge to the course of study.

The final two questions were considered an interesting indication of the problems encountered by the communication of colour. Respondents were asked to indicate their perception of what colour turquoise is from a choice of 5 colours and the same for the colour magenta. Prior to these questions respondents were questioned about colour blindness.

44.7% claimed to have had a colour blindness test, though it is assumed that most, if not all had experienced a basic test which is a popular examination given within schools. Only one respondent claimed to be colour blind to the best of their knowledge. This respondent had had a colour blindness test.
4.63.1 Identifying turquoise and magenta

The following samples were given to the respondents for their assessment of the colour turquoise. 77.6% selected only one of the five choices, having a clear preconceived idea of what turquoise is. 18.4% selected two of the five colours and 4% selected three of the five hues.

- This is a warm yellow / green.
  5.3% selected this colour as turquoise.

- This is a turquoise / green hue.
  46.1% selected this hue.

- This is equal in blue and green composition and considered to be a good representation of turquoise.
  47.4% selected this colour.

- This is a blue / green combination with a higher green content than blue.
  23.7% selected this hue.

- This is a cool yellow / green hue.
  4% selected this colour.

The following samples overleaf were given to the respondents for their assessment of the colour magenta. 77.6% selected only one of the five hues. 15.8% selected two of the five colours and 4% selected three of the five. 2.6% of the respondents did not answer this question, one of which indicated on the questionnaire that they did not know what colour magenta is.
This is a violet hue.
5.3% selected this colour.

This is a red/pink/violet hue that is a good representation of what is generally recognised as magenta.
40.8% selected this colour.

This hue is a lighter red/pink/violet than the previous colour.
10.5% selected this colour.

This is another red/pink/violet with more red content than the hue before last.
53.9% selected this colour.

This is another violet hue.
9.2% selected this hue.

4.7 Summary:

This chapter set out to assist the reader with the general colour terminology used by the colour forecaster, and through the use of a questionnaire, attempt to establish the current level of knowledge of people qualifying to possibly work within this field in the future.

The reader has been guided through the basic colour terminology discussed in the previous chapter defining hue, intensity and value. The twelve hue colour wheel was introduced and the composition of secondary and tertiary hues and neutral colours were discussed. Colour temperature, or colour bias was also found to be of significant importance in the previous chapter and therefore further discussed in this chapter.
The findings from the questionnaire were rather concerning as any one of the respondents could potentially work within the colour forecasting industry at any time during their future careers. Through the questionnaire it was evident that students studying undergraduate fashion and textile related degree courses do not possess a considerably high level of colour knowledge and their courses are not specifically addressing this problem. Similarly, postgraduates of a design and manufacture course also had a general low level of understanding of colour and colour theories. It would appear evident that more information regarding colour and its application is needed by students studying fashion and textile related courses and possibly also other design disciplines.

Finally this chapter has gone a little of the way to demonstrate the problems that presently occur regarding colour precision and colour communication. This aspect again was first highlighted and discussed in the previous chapter.

In the following chapters the colour forecasting process is further investigated and discussed and initial attempts are made to model the process.
5.

An Investigation of Methodologies

To Uncover the Underlying principles of

The Development of a Colour Story.
An investigation of methodologies to uncover the underlying principles of the development of a colour story.

Chapter 3 was used to clarify forecasting terminology, and to assess the value of the currently available literature surrounding the colour forecasting profession and its influence upon the fashion and textile industry. It also brought to light the many tools available for the forecaster and the potential monopoly that these tools can provide the forecasting profession over their clients. This would appear to arise fundamentally through the shrouded truth and lack of understanding of the level of subjectivity of the colour forecaster's tool kit.

A natural progression of study stemming from the background section would be to further investigate the principles of forecasting and their subsequent application to the development of a colour story. This chapter aims to further understand the more subjective tools that are most important in the colour forecasting process and to attempt to identify which, if any, tools are currently lacking.

5.1 The empirical and theoretical worlds.

It has been established that the process of developing a colour story is in part subjective and part objective. The experimental case studies described in the following chapter suggest that the subjective tools of forecasting were more in evidence than the objective tools, even though the subjective or soft tools were little understood by the participants, or even knowingly used by them.

(Meyers & Grossen, 1974) clarified objectivity as being factual; in general agreement of, but not necessarily truthful. Subjectivity was clarified as being primarily a belief system agreed upon by a minority with little or no evidence. Reference was also given to the concept of three worlds; the empirical, the theoretical and the human worlds, and defined in the quotation overleaf.
1. The Empirical World.
"Scientists begin with the assumption that there is a world external to themselves, and that this world can be interacted with, i.e. measured."

2. The Theoretical World.
"Scientists not only seek to measure the empirical world, but also attempt to understand and explain its workings. That is, scientists believe that the empirical world is ordered (and that we come to understand this order) or that they can impose upon the empirical world some ordered schema. This process necessitates the development of scientific theory."

3. The Human World.
"Between the empirical and theoretical worlds lies man. The empirical world is known to us through our senses or consciousness, and the theoretical world is generated by our intellect."

(Meyers & Grossen, 1974) Page 3.

The following definitions of empirical and theoretical, as given by the Concise Oxford Dictionary (C.O.D.) substantiate those given by (Meyers & Grossen, 1974) and would suggest an association with the soft tools and hard tools of colour forecasting respectively.

**Empirical** – Based upon observation/expertise not theory. Knowledge from experience. (reminiscent of soft tools)

**Theoretical** – knowledge, but not its practical application. Speculative, based on theory. Not dealing with facts presented by experience. (reminiscent of hard tools)

![Diagram of Meyers & Grossen's three worlds](image_url)

*Figure 13. A pictorial translation of Meyers & Grossen's three worlds.*
Consequently, for a subjective concept to be more generally accepted and considered with objectivity, a substantial amount of theoretical support is required. The subjective side of colour forecasting needs therefore to be better understood, tested and theorised for it to be conveyed from the empirical world and accepted in the theoretical world. A vehicle in the form of a workable methodology is required to assist the transportation of the concept from the realms of the mystical and hypothetical unconscious or super-conscious world into that of the conscious tried and tested rational world.

Soft tools available to the forecaster include awareness and observation, these are empirical tools that are based upon experimentation and previous knowledge. Other rather ambiguous but fundamental aspects of the soft tools used include those commonly known as intuition and inspiration. Intuition may be interpreted as,

*immediate insight that comes to mind without any apparent reasoning*.  
(C.O.D.)

Inspiration can be seen to have a more 'divine' attachment, suggesting a 'timely idea, intuitive but accurate.' (C.O.D). Because soft tools are in essence sensations within the mind it is difficult to measure, analyse and evaluate them, thus making them subjective in nature.

Hard tools include statistical information and conceptual models derived from previous trend information, sales data and the pool of resources available in the form of computer software. All of which inspiration can be drawn from and incorporated effectively into the development and marketing of the colour story.

The next stage necessitates the ability to study, understand, utilise and possibly modify one or a variety of methodologies. Each of which could potentially be applied to give assistance in developing an understanding and recording the findings of the principles of the forecaster’s soft tools and their application in the development of colour stories.
5.3 Methodology to the approach of the task - Data collection

There appear to be three basic approaches to the task in hand.

1) To ask a person who is directly involved in the process of colour forecasting to explain how the procedure is put into practice. (Verbal interpretation)

2) To observe, analyse, evaluate and record the process as undertaken by an individual or group of individuals. (Visual interpretation)

3) To undertake the process in a hands on manner, not just for the purpose of recording, analysing and evaluation, but also to feel the experience of the process. (Sensational/emotional interpretation.)

5.3.1 Asking for information

During the initial stages of investigating the principles of colour forecasting, design consultant and trade magazine colour trend reporter, Zina Roweth was approached to give her personal account of the process involved in predicting colour trends for the fashion and textile industry. The importance of consumer demand and consumer lifestyles was greatly emphasised as a productive forecasting tool and the power the consumer has over actual sales was prevalent. The actual process of compiling a forecast was not greatly expanded upon.

Mention was given to the concept of colour stories having base colours, or staple colours to anchor fashion colours to and a demonstration of how to recognise this concept was given. The importance of colour co-ordination within a colour story was emphasised and demonstrated through the reiteration of the apparent lack of colour co-ordination during the 1970's recession. Roweth also highlighted the evolution theory of colour and how this can be used to predict the following season’s colours. However, it must be remembered that this method has been found to be somewhat inconclusive, as the information worked from would not have been tested on the high street, in terms of consumer acceptability evident by sales figures. Sales information would be available for previous seasons trends, however a further two to three seasons trends would have evolved between those currently on the high street and the latest trend palette available.
Consumer acceptability is evident after the current season's sales period. It would be too late to alter the subsequent season's trends already worked from in the manufacturing industry. The concept of this type of error was recognised by (Hiers, 1987) during his investigation of decision thinking which is evident in the following quotation:

“Our models are shaped by the way in which we interpret our experience, and they allow us to anticipate what will or could happen in the future. But if we place a false interpretation on the past or present, or if we are insensitive and unimaginative about the future, our vision of the future will be faulty.”

Figure 14. The age of prediction packages when used by the information users.

Figure 14 above, shows the age of the predictions when applied to each sector of the industry at one given time period. Sales figures will verify if colour predictions reflect consumer demand, or desire.

Tonal value was considered to be more important than hue. An explanation was also given of how the yarn spinners include colours on subsequent shade cards that were still held in stock from unsuccessful sales of the previous season. While much of this information is relevant and interesting, the actual principles in step by step format or otherwise of the process of developing an actual colour story were not fully disclosed. (Van Someron, et al, 1994) recognised this kind of problem too, in that a person involved in performing a task is often unable to reiterate their actions and even less, the thought and decision processes that govern their choices. In their book they developed a systematic approach to modelling cognitive processes.
This methodology was incorporated into case study 2, section 6.7 and is further discussed in section 5.3.4. However, this method of data collection was considered to be weak as an option for the subsequent case studies due to the potential lack of in depth quality research it would appear to offer. It would be unlikely that any professional would be willing or able, due to human nature, to explicitly explain the process step by step.

5.3.2. Observation.

The second option would be to observe an individual or a group of individuals while actually performing the task of developing a colour story for the purpose of colour forecasting. Due to the secrecy surrounding the methodology used by the forecasting industry, it would most likely be more difficult to get permission to observe a forecaster doing their job than to try to extract an accurate verbal account from them.

(Meyers & Grossen, 1974) described the process of observation as a 'complex' procedure due to its 'two' fundamental but 'separate functions', 'sensation and perception'. Sensation was defined as a 'considered physiological process of the senses' and perception as a 'considered psychological process of the senses'. The definition of perception is given by (C.O.D) as 'act or factuality of perceiving intuitive recognition. Action by which the mind refers its sensations to extend object as cause.'

(Meyers & Grossen, 1974) continued to reflect upon perception as 'the result of the decoding of the sensations that arise as a consequence of stimulation of the sensory system'. Also, that perception 'is influenced by prior experience (learning) since it can be shown that the way one processes and translates information can change as a function of experience.' Perception was broken down into three categories,

"1) Experience
2) Idiosyncratic perceptual phenomena – where experience influences the perception.
3) Universal perceptual phenomena – information processed in similar ways by most observers and thus these experiments depend on learning to a much lesser extent than of idiosyncratic perceptual phenomena."

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(Meyers & Grossen, 1974) and (Van Someron, et al, 1994) both agreed that prior knowledge has a great bearing upon the process of problem solving.

(Sommer & Sommer, 1997) recognised three types of observation,

‘1) Casual — no prearranged categories.
2) Systematic — prearranged categories
3) Participant — having the advantage of the emotional experience that is not possible with 1) and 2).’

Problems associated with systematic observation were highlighted as follows:

‘Pitfalls to be avoided in systematic observation.

1. Reactive effects from being observed; a guinea pig effect in which awareness of being watched changes behaviour.
   a) People becoming self-conscious and not behaving as they normally would.
   b) People attempting to accommodate the observer, doing what they believe the observer wants them to do.
   c) Influence of the observer's specific appearance or manner on people's actions.
   d) Changes in accommodation to the observer during the course of study.

2. Investigator error.
   a) Unclear and unreliable observational categories.
   b) Bias on the part of the observer.
   c) Changes in the observational procedures in the middle of the study.
   d) Not checking reliability before the study begins. Learning too late that the categories for observers are not reliable.

3. Selection bias.
   a) People being observed are not representative of the groups to which the results will be generalised.
   b) Inadequate time periods selected for observation.
   c) Sources of bias due to weather, day, location, etc.”

The problems set out above, particularly those highlighted in 1, were taken into account during the planning and execution of case studies 1 and 2, discussed later in chapter 6.
5.3.2.1 Naturalistic observation.

Naturalistic observation refers to the method employed when observing someone or something in its natural environment. (Meyers & Grossen, 1974) considers this a good methodology using the analogy, “if you want to find out what an elephant does all day, the best thing to do is to watch one.” However it is also acknowledged that it is not an ideal methodology for understanding why such behaviour is employed. The literature review critiqued in chapter 3 gave a good grounding for the understanding of how the process of colour forecasting is achieved as a whole, but lacks the understanding of why, in terms of thought, reasoning and decision making processes. In naturalistic observation the observer has no control over the process or outcome. In laboratory experiments the researcher can have almost complete control. In a midway point situation, partial control can be achieved by the manipulation of the independent variables, as discussed later in section 5.3.5.

5.3.3 Participant observation.

The third option for the collection of data is known as participant observation. This is where the researcher or observer actually takes part in the process of the task while recording the required data as they progress. A very positive advantage of this method is that the researcher can experience the feel of being involved in the task. With the previous two observation processes only the human senses of sight and hearing are used. With participant observation the tactile sense is incorporated, the hands-on experience gives a richer ingredient, that of sensation. One participant observer was reported to have said,

‘It wasn't a question of discovering new facts, since most of what I had found was already known, but of discovering what it meant to 'feel' the facts.’

(Sommer & Sommer, 1997) page 53

(Jorgensen, 1989) defined participant observation as follows;

"a detailed description and analysis of an individual case study ... holistic examination of a phenomenon -- avoiding separation of components to describe comprehensively and exhaustively a phenomenon in terms of a research problem."

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This methodology requires;

"that the researcher become directly involved as participant in people's daily lives — stand point of a member or insider, observing and proactive."

Page 20.

More importantly;

"... it focuses upon human interaction and meaning viewed from the insiders viewpoint in everyday situations and settings. It aims to generate practical and theoretical truths formulated as interpretative theories.... Involves flexible, open-ended, opportunistic process and logic of inquiry through which what is studied constantly is subject to redefinition based on field experience and observation."

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Participation observation can be employed either with the consent (overt) or without the consent (covert) of other group members. While a more true analysis and evaluation may be possible working covertly, it may not be considered ethical and therefore infringe upon personal privacy.

An important aspect of this methodology was recognised by (Jorgensen, 1989) reflecting upon the concept of

"personal interests hold potential for new insights and creativity inspired by emotional and intellectual identification with the topic of study. Rather than denying personal interests and values, the methodology of participant observation requires awareness of how these thoughts and feelings influence research."

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(Jorgensen, 1989) also recognised that due to the complexity of the methodology, refinement of the process must occur while participating and collecting the required data. However, favorably, this type of methodology "reduces the possibility of inaccurate observation, because the researcher gains through subjective involvement direct access to what people think, do and feel from multiple perspectives."
5.3.4 The think aloud method.

As previously mentioned in 5.3.1, (Van Someron, et al, 1994) formulated a methodology useful for developing an understanding of thought, reasoning and the decision making processes. The basis of this methodology works upon the realisation of a person’s inability to accurately describe the process that they undertake in order to complete a given task, with particular emphasis upon the thought processes applied. This concept had been previously recognised and investigated from the late 1930s onwards by Gestalt psychologist Karl Dunker, who was interested in the processes of problem solving with particular emphasis upon the experience of insight (Garnham & Oakhill, 1994). The method formed the basis of experiments conducted by Dunker and published in 1945 (Gilhooly, 1988). Newell & Simon’s work on this concept was published in 1957, they were more interested in the modelling of this concept (Garnham & Oakhill, 1994) which is further discussed in section 5.4 and used by (Van Someron, et al, 1994) whose work on human problem solving recognised spoken and written protocols.

A systematic approach was described for the process of collecting and analysing data for the purpose of researching cognitive processes. This was approached by the use of video recording for the observation processes of research. It relied upon participants speaking their thoughts out loud while performing a particular task while being video taped then transcribed into written protocol. Think aloud experiments were also conducted by Klinger and published in 1971 and by Catherine Patrick in 1935 and 1937. (Gilhooly, 1988).

However, there are flaws in the methodology that should be considered before applying it to an experiment. Some of these were highlighted previously by (Sommer & Sommer, 1997), section 5.3.2 such as, self-consciousness affecting behaviour. This could be even more evident with recordings as pointed out by (Jorgensen, 1989), stating that ‘tape recorders are obtrusive’, and that ‘videos are highly obtrusive.’ In 1978 Pope & Singer published their concerns of ‘draw backs to the think aloud process’. They argued that ‘verbalising may slow down the rate of flow of thought, affecting the nature of the stream of consciousness.’ Klinger developed a method of irregular cueing where the subject was interrupted periodically to record their thought processes via a questionnaire. The effectiveness of this method was not clearly defined. (Gilhooly, 1988)
(Van Someron, et al, 1994) were in agreement with most authors on the subject, that knowledge, either previously attained or since acquired from the environment has particular bearing upon the thought, reasoning and decision making processes. Memory or a visual source of data are therefore an important asset. Memory and general knowledge were formulated into a systematic format as follows,

1. **Perception**: Information flows from the sensory buffer into working memory.
2. **Retrieval**: Information is retrieved from long-term memory into working memory.
3. **Construction**: New information is constructed from other information in working memory.
4. **Storage**: Stores information from working memory into long-term memory.
5. **Verbalisation**: Information that is active in working memory is put into words. The output of this process is the spoken protocol.

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### 5.3.5 Variables

Variables are components of experimental research which were discussed by both (Meyers & Grossen, 1974) and (Sommer & Sommer, 1997). Essentially, variables are measurable and may be either dependent or independent. Variables that permit the experimenter to manipulate are known as independent. Dependent variables are those 'affected' by the experimenter's manipulation (Sommer & Sommer, 1997). Any aspect of an experiment that does not permit variation is known as a constant.

When applying this methodology to colour forecasting, the tools, both subjective and objective, become the independent variables. The dependent variables become the thought, reasoning and decision making processes and the brief to be adhered to for the final colour story is the constant. It could be of interest to establish which, if any of the variables could be eliminated from the colour forecasting process in order to simplify the task from which a potential conceptual model could be designed.
5.3.5.1 Correlational research.

The process of elimination is directly related to correlational research. Correlational research is the terminology used to 'determine the extent to which two events are related', (Meyers & Grossen, 1974) also recognised three application methods of correlational research:

"1) Simply to describe the degree of relationship between two variables
2) to serve as a basis for designing experimental research
3) to predict." Where prediction "becomes an estimate of what we would expect on the average. The higher the correlation, the better the estimate should be."

When applying correlational research to colour forecasting, the two related events become the process of colour forecasting and the end result, i.e. the colour story. Theoretically, pure intuition or total random selection could be employed in order to produce a colour palette for forecasting purposes. The success of the selection could be tested either through market research techniques or through high street sales, if the information was used by the industry. This would all of course be subject to trial and error. However, using the process of elimination of variables could help to determine which are most vital to a successful prediction of colour, which could be tested, measured and recorded prior to its use by the industry.

5.4 Newell and Simon's psychological theory of problem solving.

The concept of a psychological theory for problem solving developed by Newell & Simon was discussed by (Van Someron, et al, 1994). They recognised a 'sequence of steps' that the problem solver essentially undertakes during the process of finding a solution to any given problem. With each of the steps a change occurs in the current level of knowledge of the problem solver. In the beginning it is said that only 'the initial state' is known. When applying the methodology to colour forecasting the initial state becomes the brief, or goal of the forecaster, i.e. the problem or task of developing a colour story for prediction purposes. Additional knowledge is subject to the brief, such as the requirements for a particular company subscribing to the service. Steps taken thereafter in terms of the collection of information and thought, reasoning and decision making processes are said to 'add something to the initial state'.
The additional knowledge that is responsible for the changes in the state are known as ‘operators’. Therefore the process begins with the initial state, any number of operator applications are then applied until a satisfactory solution is found, which is known as the ‘goal state’. It was implied that the knowledge given in the initial state as, ‘the instruction to the task can be translated into operators that can be applied to the initial state.’

States were previously recognised by Dunker in 1945 as a starting state, ending with a goal state with a set of processes known as protocols that can transform one state to another. (Garnham & Oakhill, 1994) Reitman in 1965 also proposed the same three components (Gilhooly, 1988).

This methodology was used during the analysis process of case studies 1 and 2 and is further discussed in 5.5. An interesting point to question here is that of the goal state when applied to colour forecasting. While it is easy to understand that the goal state would be the final colour palette to be used for the purpose of colour forecasting, how does one know when this has been achieved and how does one interpret each new state. All of the tools of problem solving are recognised tools of colour forecasting as established in chapter 3, with the exception of just one, intuition. Thus far, research into the scientific methodology of problem solving and human behaviour lacks recognition of this most powerful tool. In the process of experimental research the experimenter would test the goal state. In colour forecasting the test is in the sales on the high street, this is too late for the retailer and manufacturer. As no particular testing is applied to the goal state, the forecaster relies purely upon intuition to determine whether or not the goal state has been reached and therefore the subjective tool, intuition, requires investigation. This is further discussed in section 5.7.

5.5 Analysis.

At some stage either when the process of data collection is completed or at a stage when the information can be collated for use while collection is still in process, the information undergoes the procedure of analysis. (Jorgensen, 1989) discussed analysis and its apparent cyclic format as follows overleaf,
“Analysis is a breaking up, separating or disassembling of research materials into pieces, parts, elements or units. With facts broken down into manageable pieces, the researcher sorts and sifts them, searching for types, classes, sequences, processes, patterns or wholes. The aim of this process is to assemble or reconstruct the data in meaningful or comprehensible fashion. In making sense of the data, you are engaging in theorizing the construction of meaningful patterns and organizations of facts. A theory is an arrangement of facts in the form of an explanation or interpretation.”

Page 107.

Further to this (Jorgensen, 1989) recognised that initial information gathered effectively ‘refines the research problem.’ Data collection becomes more specific as the problem is ‘clearly defined.’ A stage then comes to pass whereby the additional information has lesser importance than that of the analysis of the information. When applying this to colour forecasting, the information collected becomes more important as supporting evidence as opposed to the promotion of inspiration. Thought, reasoning and decision making processes become the driving force behind the ideas to accomplish the colour story.

5.6 Evaluation

Once the information has undergone the analysis stage it is then evaluated. This procedure may involve scientific measurement or in the case of colour forecasting a more intuitive judgement is concluded. (Jorgensen, 1989) describes the process of ‘coding the data’ as,

“leading to sorting, sifting, organising and recognising these materials, usually into larger units and components. Sometimes this involves ‘flashes of insight’ about how things fit together. While at other times it depends on less dramatic hunches or simply hard work.”

Page 110.

Recognition was also given to that of ‘creativity’ being the key element responsible for discovery resulting from the analysis of data. The process of evaluation concludes with the interpretation or explanation of the problem. When applying this to colour forecasting, this would be the final colour story of the forecaster in its completed format.
As previously mentioned in section 5.4, the forecaster's soft tool, intuition, warrants some discussion, particularly as it is considered as one of the most important tools available to the forecaster, as established in chapter 3. While mention was given to the concept, the underlying aspects were not expanded upon by the authors of colour and fashion forecasting, this was also confirmed in chapter 3. Little recognition of intuition is granted by authors of behavioral research, let alone discussed. In order to evaluate intuition it was therefore necessary to approach the subject from a wider perspective. Many informative books have been written incorporating intuition within the realms of mind, body and spiritual development, many however separate intuition from the scientific world, just as authors of science separate themselves from the subject of intuition. (Vaughan, 1979) on the other hand, wrote specifically on the subject of intuition giving it a place in both the theoretical and the empirical worlds.

5.7.1 Intuition and knowledge.

(Hiers, 1987) proposed the notion of intuition as being 'that subconscious instrument of our thinking' and subsequently referred to it as the 'Eureka Factor' which is most effective during relaxation, i.e. while asleep. Plotinus was recorded to have concluded:

"Knowledge has 3 degrees – opinion, science, and illumination. The means or instrument of the first is sense; of the second, dialectic; of the third, intuition. This last is absolute knowledge founded on the identity of the mind knowing with the object known."


The recognition and importance of intuition has long been appreciated by the late greats of time, so why does it appear to have been swept under the carpet by many of the knowledgeable today, or is it. Is it more a case of using it unknowingly, or using it but unable to explain it, and therefore underestimate its importance.
"Intuition is also the psychological function operative in scientific inventions or discoveries. Mathematicians, for instance, readily acknowledge the value of intuition in formulating new hypotheses, and exercise proof and verification as secondary processes. Likewise in physics and other sciences, it is intuition which provides researchers new possibilities to pursue with the instruments of science. The history of science shows clearly that great breakthroughs in human understanding have been the result of intuitive perceptions that are only later tested and verified."


While some may recognise the existence of intuition and its importance in the practicalities of today's objective world, many still dismiss it either completely or in part, therefore banishing it to the world of the occult, where it can accompany other subjective ideas and entities which are little understood. However, there would appear to be a minority, at least willing to print, that can appreciate a necessity to bridge the gap between the two worlds, which could lead to a new, rich and diverse field of research for the scientifically minded.

5.7.1.1 The universal mind.

(Hudson, 2001) recognised the gap between the two worlds in the opening statement of the article 'A meeting of minds', which refers to the subjective world as that of the occult. To bring the realms of occultism into context here, the Concise Oxford Dictionary defines occult as 'kept secret, hidden from view, beyond the range of ordinary knowledge.' No reference is given to any religion or devil worship, and it is therefore easy to appreciate a link between intuition and the understanding of the intuitive process that may sit nicely into this definition.

The article in essence gave credit to the work of biologist Dr Rupert Sheldrake and his theory of a universal mind, which was also conceptualised by contemporary writer, scientist and inventor, Itzhak Bentov who was quoted as having said;

"Intuition is a way of knowing without getting there in a linear, rational way we normally function. Basically what we are doing is tapping into the reservoir of knowledge contained in the universal mind. It is already there in holographic form, so when a certain person needs a solution to a particular problem, the so called intuitive flash may occur. This is a situation when people go into another state of consciousness for just a very short period of time. They go up into the intuitive level, where subjective time is greatly extended. So in a few seconds of objective time they can see the solutions to all their problems. They can understand them at their leisure and then come back — into objective reality."

(Vaughan, 1979) Page 171.
Sheldrake's theory, while not ignoring the importance of genetics, works upon the hypothesis that our genetic programme is stored outside the body as opposed to inside the body by DNA. DNA, is recognised as a record of the physical body data only. The name morphogenetics has been given to the theory and is more concerned with the etheric body make up. Sheldrake believes that this source of information can be tapped into in order to acquire new knowledge and skills. Apparently successful experiments can substantiate this claim. The theory conceptualises the idea of the memory been stored within the morphogenetic fields as opposed to within the brain. This is said to be akin to the universal mind that the clairvoyant/ telepathist can also tap into.

To link science to occultism, the article proposed that Sheldrake's theory is essentially related to that of eminent psychic, Edgar Cayce. Cayce popularised, if not founded the concept of the Akashic record. From Sanskrit, this term means 'fundamental etheric substance of the universe' which it is said to be available to all, if one knows how to access it. This was apparently the source of information that Cayce used in his psychic work.

(Hudson, 2001) provided the notion that while the concept of the Akashic record is a difficult one for most to apply their minds to, it may appear evident that Sheldrake has made this possible through his research, stating that;

".. both struggled with the same concepts through two different disciplines, Sheldrake through scientific theory and experiment, Cayce through psychic healing and life readings."

Page 59.

Hudson also threw a proverbial spanner into the works of thought with the notion of Sheldrake unconsciously tapping into the psyche of the late Edgar Cayce, which has subsequently prompted Sheldrake's research. As with any conceptual idea of a subjective nature, its credence lies within the belief system of the reader. However, it has been implied in the main by colour forecaster Li Edelkoort, that part of the process of forecasting is attributed to the ability to tap into the universal Zeitgeist. (Fearon, 1996) promoted this claim in an article published in Knitting International, which had to originate from somewhere.
It could be considered from the similarities evident in colour stories shown by many members in attendance of colour meetings that such a universal mind could exist. Is it possible that colour forecasters do in reality tap into the Zeitgeist during the process of using intuition, and if so, can this acclaim ever be measured and proven.

5.7.1.2 Experience

An aspect of knowledge that should be addressed is that of experience. Newell & Simon, along with others as previously stated, worked with the concept of operators that bring new knowledge to the problem state, experience could be recognised as an operator. It could be questionable whether or not, that forecasters consciously or otherwise be inclined to include into their predictions, colours based upon their own preferences. Could the more novice forecaster be more prone to doing this more so than the more experienced and knowledgeable forecaster.

(Hiers, 1987) put forward the concept that both age and experience has a direct effect upon thinking, proposing that thinking becomes more reflective and that personal feelings are less likely to affect decisions. Experience been interpreted as having a dual function, to provide 'raw material for our models past, present and future' and 'as a tool for interpreting new experiences into our existing models.' However, the quality of interpretation of experience has a bearing upon the model of reality and therefore re-evaluation may be necessary. Imagination was considered to be an important factor in model making to assist in breaking through new ground and reconstructing out of date models. It was therefore suggested that 'experience, reason and imagination are the interdependent, conscious mental instruments poised for action.'

5.7.2 Intuition and science

While scientific methodologies appear to lack recognition of intuition, there have been distinguished persons within the field that have been willing to give recognition to the value and importance of intuition in the world of science. Particular emphasis has been made to its role in discovery. Some of these statements were compiled by (Vaughan, 1979) and give weight to its indispensability in science.
Michael Polanyi, Professor of physical chemistry and philosopher was recorded to have said:

"... the scientist produces problems, has hunches, and, elated by these anticipations, pursues the quest that should fulfil these anticipations. This quest is guided throughout by feelings of a deepening coherence, and these feelings have a fair chance of proving right. We may recognise here the powers of a dynamic intuition.... It is this dynamic intuition which guides the pursuit of discovery."

(Vaughan, 1979) Page 150

The Physicist, Fritjof spoke of intuition as the insight and creativity required in scientific research to break new grounds. He recognised that this process occurs in the main when in a relaxed state as opposed to applying the mind consciously for a solution. Einstein was also reputed to have recognised the value of intuition to the application of problem solving. (Vaughan, 1979)

5.7.3 Intuition and creativity.

Intuition is quite possibly more acceptably recognised in the art disciplines than within those of a scientific nature. It is often thought synonymous with artists instinctively knowing when something is right, such as a painter's colour or a composer's melody. The important factor is that in the art world there is no need for justification. In the world of science everything must be verified, tested, measured and brought into the realms of the theoretical world. If intuition is not quantified, at least enough to understand it, it has no apparent place in science. Intuition however, could be interpreted as the driving force of creativity. Creativity can inspire new knowledge, or at least bring knowledge into the conscious realm if indeed it is already written in the universal mind.

When applying this to colour forecasting, the forecaster is in a sense, obliged to justify the trends predicted, at least to their clients. However, the reasoning can be cleverly interpreted through the use of marketing techniques to convince the client of its legitimacy with conviction. The real thought, reasoning and decision making processes are not justifiable, and it does not explain how the forecaster decides what is right, what is not, and when the goal state has been achieved.
5.7.4 Intuition and decision making.

While the scientific world invariably deviates from the subject of intuition, particularly it appears in the field of behavioural research, many authors writing specifically on thinking and thought modelling, appear to be more open to the concept of intuition and its usefulness. In retrospect, decision making is a process of judgement and elimination based upon cognitive thought and reasoning management and therefore an element of intuition must be involved to a level of extent.

(Vaughan, 1979) claimed that “decisions are based on what is known, and on what is intuitively felt to be the right course.” Also that “decision making necessarily goes beyond factual data.” It is also stressed that intuition plays an integral part in decision making on all levels in everyday life, though it is not always a conscious entity.

It may also be feared that if intuition were to be quantified it may limit its creative potential, at least in the minds of those that become aware of its definition. This was particularly emphasised by (Edlekoort, 1999).

(Hiers, 1987) suggested “7 special features that separate decision- thinking from other forms of thinking”, these are set out below.

1. Decision-thinking is a game of imperfect information, involving the future, change and human action and reaction.
2. Because none of us lives outside the stream of time, we are obliged to try to predict the future—short-, medium- and long-term—consequences of every decision before we make it, even though those consequences cannot be predicted with certainty.
3. Since we cannot ‘know’ the future, we have to hedge against our decision going wrong by trying, in advance, to create contingency plans.
4. Most of the important decisions we make are not dealing with problems that will have right or wrong answers, but rather only better or worse solutions—hence our need for debate, devil’s advocates and rigorous, dispassionate and intuitive thinking.
5. The results of most of our decisions will depend upon how other people react to them, and those reactions have to be predicted before we make our decisions.
6. Probability estimates always need to be made, again in advance, of the chances of our decision succeeding.
7. Lastly, risk/reward calculations also have to be predicted beforehand to find out if it will be worthwhile to try to achieve our objective—even if it is highly probable that we will successfully carry out our decision. We always need to remember before we make any decision that ‘something not worth doing, is not worth doing well’.
Point 1 above is a good representation of the process undertaken by the colour forecaster. The imperfect information being the database of source material available and the previous predictions compiled that are used either strategically by the forecaster or at least borne in mind. Change and human reaction are factors that prove whether or not the predictions are accurate in terms of sales, this is also reflected in point 5.

Points 2 and 3 emphasise the fact that predictions are fallible. Contingency plans maybe asserted in the inclusion of staple colours carried through the prediction packages over a longer time period than that of fashion colours.

Points 4 and 6 are interesting. How much consideration to these aspects are given by the forecaster? These may be of more consideration for the prediction users, i.e. the fibre, yarn and fabric manufacturers and retailers, this could also be true of point 7. The risk factor is of more consequence to this market sector than to the forecasting sector. Particularly as once a company is a subscriber to a forecasting company, it is quite likely that they will remain so for some considerable time. Perhaps until such a time that it is realised that the predictions are not as accurate as they would have expected or hoped for, and still may feel compelled to subscribe to the service for safety sake, poor advice and guidance being better than none at all.

It has to be remembered that it is not only the forecaster that uses decision making processes, but also the information users. Their role in the prediction procedure is of much importance as a selection process is applied to decide the colours that will be used for the end product and offered to the consumer. It would be of interest to establish therefore, if the same thought, reasoning and decision making processes apply to both the forecaster and the information users, who at this stage are forecasting trends for their company's products. At this stage, is it fair to assume that the information users are confined to the ideals presented by the forecasters or do they exercise their own powers of prediction,

"Since decision thinking is concerned with finding practicable solutions to real problems in the real world, our perception of reality must be as accurate as possible. But we do not perceive most reality directly, rather what we perceive are our own models of reality, which we have created or borrowed from other people."

(Hiers, 1987) page 144.
Is there an element of freedom in choice for the information user to implement their own intuition beyond the advice of the forecasters. If this would be the case, then the information user could exercise their own forecasting methodology which could be more cost effective and more accurate in terms of that company's merchandise meeting consumer demand, creating a higher sales volume for both the manufacturer and the retailer. This highlights yet again, the importance of prediction within the manufacturing sector and the dispensability of the forecasting sector.

5.7.5 Thought.

The think aloud method discussed in section 5.3.4 involved the use of cognitive psychological processes. (Gilhooly, 1988) promoted Wetherwick's (1979) idea of cognitive psychological processes being that of 'modelling man's model-making capabilities' and that 'thinking often seems to involve inner speech or visual, auditory or other forms of imagery', of which intuition could be also interpreted as.

Gilhooly proposed to separate directives of thought processes into two categories, the first of which are considered to be 'undirected', referred to as 'daydreaming' and secondly, the more directional ones. Either way, thinking was portrayed as an assembly of information to be used as 'mental model'. In accordance with Gilhooly, thinking is 'reflective', other authors refer to mental modelling as 'deductive thinking', 'inductive reasoning' and 'problem solving'.

Directive thinking is often thought of as a tool used to meet an end goal, whereas undirected thinking is considered to have a lesser connection to an end result. English philosopher, Thomas Hobbes defined these two directives more than three hundred years ago. Undirected thought was implied to be,

"unguided, without design and inconstant, thought are said to wander and unrelated to one another. "And yet in this wild ranging of the mind, a man may oft times perceive the way of it, and the dependence of one thought upon another".

Direct thinking was described as having a more constant nature and regulated by design and/ or desire (Gilhooly, 1988).
Chapter 3 was instrumental in establishing the wide-spread use of intuition as a prediction tool employed by forecasters. In this chapter the concept of the empirical and theoretical worlds were discussed in order to better understand the difference between the subjective and objective sides of colour forecasting. Various methodologies for data collection were discussed and evaluated and finally intuition, a very important soft tool of the colour forecasting process, was further discussed in order to establish a deeper understanding of this phenomenon. This led to the recognition of the importance of decision making processes and thought and reasoning. These aspects are further investigated through two case studies discussed in chapter 6.

It would appear that no specific tools have been found to be currently lacking from the process of colour forecasting, though as previously highlighted, an important source of data, consumer preference data, is currently unused to its full potential.

This section has assisted in the development of a more sound understanding of the concept and importance of the decision making process. The final words on this phenomena are accredited to (Vaughan, 1979) whose summary speaks volumes.

"The wisdom of intuition does not follow the rules of logic. It will never make rational, discriminating choices for you. It is no substitute for careful research or data gathering. It is a purveyor of possibilities, not an evaluating factor. .... Pure intuition remains unaffected by thoughts and feelings, and will always take you beyond the boundaries of present conscious knowledge."

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6.

The Development of a Colour Story.
6.

The development of a colour story.

This chapter was designed to look deeper into the methodology and its application in the development of a colour story. Chapter 3 highlighted the problems encountered by the layman to fully understand how this process works, as little in depth information is currently available. Colour forecasters appear to be reluctant to divulge this information any further than the bare basics, possibly in a bid to protect their monopoly upon the industry. However, it is considered important for fashion and textile design students to understand the implications of colour and to understand how to develop and work with colour trend information. This chapter concentrates upon developing an understanding of how colour forecasting methodologies are taught and implemented by student designers in order to produce colour stories combined with a study of further relevant methodologies.

6.1 Colour forecasting – Assessment of student modules.

An observation exercise was developed comparing two modules of the same title with similar aims directed at undergraduate students, taught simultaneously in two different faculties of the university. Both modules were taught for the duration of one semester by different teaching staff. Some interesting observations were made in firstly, the delivery and teaching of the two modules, secondly and more importantly, in the approach to the assignments by the students. These two factors prompted the questioning of the decision making processes that influence the development of the colour story for forecasting purposes.

A more in-depth understanding of the forecasting process methodology was established through the following two case studies of colour story development. Each student or group of students taking part in case study 2, were requested to develop a colour story. The amount of thought and rational thinking of each participant varied particularly from those of case study 1 and of case study 2. Logically, anyone can produce a colour palette either by using a thought out method or based purely upon an intuitive method, or even by employing an entirely random process of selection.
The important factor where colour forecasting is concerned is how convincing the colour story is as a predictive tool for the industry in terms of accurately assessing consumer demand, resulting in high volume sales, this will be addressed in the following chapter.

The process of colour forecasting is essentially a seasonal problem to be solved in the form of a colour story. (Van Someron, et al, 1994) referred to problem solving as 'constructing solutions and constructing justifications of these solutions'. The problem that the forecaster should have to solve is the development of a convincing colour story that reflects the desires of the consumer for a given season. The forecaster must justify the colour story to the information user, most likely in a visual format, i.e. the prediction package.

6.1.1 Style and colour prediction module for textile students.

This module was delivered within the faculty of computing sciences and engineering to thirty one students studying textile related degrees, one third of which were HND students, the remainder, BSc students. The aim of the module was to enable students to understand the role of the forecasting profession within the fashion and textile industry and to understand how colour prediction packages are developed and to evaluate current and past trend information. Students were required to work within groups in the role of design teams. Mood boards were to be produced by each student for assessment. One tutor and two guest lecturers were used to deliver the content of the module and a fourth member of staff supervised the workshop period. The three hour allocated time period was divided into one hour lecture time and two hours workshop with additional self directed learning time.

6.1.2 Styling and colour prediction module for fashion students.

This module was delivered within the faculty of art and design to thirteen BA fashion students. The aim of the module was to enable students to understand prediction information and its role in the industry; to research and develop a prediction package for a chosen market and to encourage personal creative, graphic and presentation skills.
Students were required to work individually in the role of a forecasting company. Four mood boards and a professionally designed prediction package were to be produced by each student for assessment. One tutor delivered the content of the module. The three hour allocated time period was used as a group discussion workshop with additional self directed learning time.

6.1.3 Module timetable of delivery and progress.

<table>
<thead>
<tr>
<th>Week</th>
<th>HND / BSc Textiles.</th>
<th>BA Fashion.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td>Guest lecturer – Career background given. Looked at UK and European spinners shade cards and trade show cards. Power point presentation of Autumn / Winter 2000/1 trends.</td>
<td>Talked through the handbook and assessment requirements. Visit to the library observing, discussing and evaluating prediction trend packages. Students were encouraged to start collecting images /other media and think about their 4 themes.</td>
</tr>
<tr>
<td><strong>Week 2</strong></td>
<td>Guest PhD researcher – Presentation on the history of forecasting and the driving forces of fashion. Visit to the library to observe trend packages and Worth Global Style Network Ltd. (WSGN) website. Students observed and discussed previous student's work to give an understanding of their assignment requirements. Students were encouraged to develop their own ideas of presentation for their packages. Semantics were discussed for conveying the mood of each theme and overall theme if desired. Many students had started collecting images, colour cards, fabrics etc., and discussed their ideas for themes.</td>
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<tr>
<td><strong>Week 3</strong></td>
<td>Guest Lecturer – Shown colour trends – Expofil 2001/2, Pitti Imagine and Premier Vision. Discussed the importance of lifestyles. Looked at fibre company shade cards. Slide presentation of exhibitions. Brainstorming session on lifestyles. Students were recommended to look at the WSGN website and current high street trends.</td>
<td>Students showed and discussed their progress to date. Brainstorming as a group. Some students had already made their mood boards. Others had decided themes. Mood boards were to be completed by the following week.</td>
</tr>
<tr>
<td><strong>Week 4</strong></td>
<td>Guest Lecturer – Groups formed by staff. Each group given a lifestyle to work from. Groups brainstormed ideas and discussed colour.</td>
<td>Students showed and discussed their story boards and ideas. Colour palettes were to be finalised by the following week.</td>
</tr>
<tr>
<td><strong>Weeks 5 to 11</strong></td>
<td>1 hour CAD tuition. 2 hours group workshop Student participation during these weeks was poor.</td>
<td>Continued to show and discuss work and problems to date. Group split into 2 to allow extra work time to students.</td>
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<tr>
<td><strong>Week 12</strong></td>
<td>Guest Lecturer – progress and problems discussion.</td>
<td>Finalising packages.</td>
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<tr>
<td></td>
<td>Presentations and submission of work.</td>
<td>Presentations and submission of work.</td>
</tr>
</tbody>
</table>
6.1.4 Assessment of the two modules.

Both modules were aimed to give the students an understanding of the role of the forecasting profession within the fashion and textile industry. The following summary however identifies a factor that prevented this aim being fully achieved in either module.

The findings of chapter 2 revealed a rich history supporting the development of the forecasting profession. Chapter 3 identified key elements of the forecasting process used by forecasters. Chapter 4 gave a basic insight into how colour works. It is considered that these three chapters would provide a good foundation upon which to build a potentially successful teaching module for both fashion and textile students. It is considered to have been advantageous therefore for some content of these three basic areas of study to have being included in each of the two modules assessed.

6.1.4.1 Historical background information.

The textile students were presented with a condensed historical background of the driving forces of fashion over the past three hundred years, to help them to understand when and why the need for forecasting came into being, and its role within the industry today. This was included within the module by special request of the guest lecturer, and not originally planned by the module leader/ writer.

6.1.4.2 The key elements of the forecasting process.

The textile students were also presented with a considerable amount of visual trend prediction information and the concept of colour evolution was discussed in general. All the elements of the forecasting process discussed in chapter 3 however, were not provided to the students. Neither were these key elements provided to the fashion students.
6.1.4.3 Colour knowledge.

Both modules appeared to work on the assumption that students had previous colour knowledge, most likely in the form of an art and design foundation qualification. Findings from the questionnaire discussed in section 4.6 suggested that the colour knowledge of the students could be considered inadequate for their potential future careers. In accordance with the university prospectuses 2000 and 2001, the textile students were not required to have completed an art and design foundation course, nor was such a background recommended. The art and design foundation course was a desirable prerequisite of the fashion courses, but not considered essential. Many UK college and university prospectuses were referred to, none of which specified any colour learning content on art and design foundation courses.

6.1.5 The role play of the students.

There are two basic sectors of the forecasting industry; the information implementers and the information adapters. The former include international and national forecasting companies, where their end product is the trend prediction package. The latter includes fibre, yarn and fabric manufacturers. The end product of this sector is primarily the raw materials, i.e. yarn and fabric, used by the garment manufacturers. It is usual for the information adapters to develop and produce their own trend information, either in the form of a package or in the form of shade cards for their customers. The information users include the garment manufacturers and retailers. A combination of both may be produced particularly for stand presentations at trade exhibitions.

It is the information adapters that rely heavily upon the accuracy of trend prediction information more so than the information implementers and therefore have greater dependency upon the knowledge of both the colour forecasting process itself and understanding the needs of the consumer. The students studying the forecasting module through the fashion discipline imitated the role of the information implementers, as they were acting as fashion forecasters. The students of the textile discipline were acting as information users for a textile company.
6.1.5.1 The fashion students

In order for the information implementers to sell their ideas, their packages become their marketing tool. Creativity and novelty become an integral part of the package design to sell the colour story predictions. Presentation skills are therefore an important skill aspect for this sector of the industry. The importance of this skill may be considered as an equivalent to that of the development of the colour stories themselves. In accordance with this, the fashion students were encouraged to be aware of the professionalism of the design of their own packages. It is important to consider if the prime task of these students was to develop their own design and presentation skills or to understand the process of developing colour stories with confidence and accuracy, to work in the forecasting industry. Also, for the purpose of colour forecasting in the role of the information implementers, which skill is the most important anyway? The role of the two student groups was determined by the module assignments set by the teaching staff respectively.

6.1.5.2 The textile students

The role play situation of the textile students did not require them to have such high skills in presentation. Only mood boards were required, not an entire prediction package. These students still needed to be capable of selling their ideas of trends through the mood boards and creativity should still play an important part in this task. It transpired that the students lacked these skills from their previous educational background requirements for the course, nor were they taught the necessary skills within the module. This would effectively put these students at a great disadvantage in the forecasting profession within the information implementers sector, and possibly within the sector of the information adapter.

6.2 Observations

By week two, it became evident talking to various students from the textile group that colour knowledge was lacking by many of the students. This inspired the development of the questionnaire previously discussed in section 4.6.
By the same week, the fashion students were proving to be an interesting group to observe. This module was run to a tighter schedule and a larger project assignment was to be achieved by each student. As the group was much smaller a productive discussion workshop scenario was possible, which worked well for the students and also for the purpose of the observation research process. However, during the latter weeks, the students requested that they should have individual tutorials within the workshop to enable them to continue with the practical work within the studio time allocated to them. Upon reflection, the tutor felt that this approach was detrimental to the brainstorming sessions that had previously worked so well.

6.3 Case study one - fashion students.

A separate case study developed using only the fashion student module, this was due to the following observation of this particular group. The students were effectively working from the same sources of information and aiming to arrive at the same place; in terms of the assessment requirements and criteria however, they were showing distinctive signs of applying variations in working, thinking and problem solving methodologies to the task in hand. This raised queries regarding thought, reasoning and decision making processes underlying the compilation of colour stories and a case study of these students developed.

6.3.1 The task.

The students were given a set brief to work from. They were encouraged from the onset to develop innovative ideas for the final presentation of the mood boards and the professionally designed trend prediction package. They were also inspired to consider a target market, consumer lifestyles and a company image.
6.3.2 Requirements.

The requirements set in the brief for the development of the colour stories were:

* To develop four individual themes / moods with an optional overall theme connecting the four themes.
* To give each theme a title.
* To demonstrate the mood of each theme through visual imagery and optional semantics.
* To develop and present a predictive colour palette for a given season.

6.3.3 Tools available.

The subjective tools available to the students were:

* Awareness of the environment and previous trends.
* Observation skills.
* Intuition.
* Use of thought, decision and reasoning processes.

The objective tools available to the students were:

* A reservoir of data in the form of imagery, fabrics, colour cards etc.
* Previous trend information available at the university library.

6.3.4 Method

The progress and articulated thoughts of the students from the group were recorded during weeks 3 to 5 to evaluate their approach to the assignment. This was based upon the observation methodology referred to in section 5.3.2. By week 5 the students were time tabled to have completed their mood boards comprising their colour palettes for the project, therefore progress beyond this week was not considered important for this section of the research and for this reason information thereafter was not documented.
6.3.4.1. Student 1.

Progress. By week 3 this student had produced the boards. Using key words on each board, inspiration came from the actual words selected. (The appearance of the boards were visually very much like a set of boards shown by the tutor the previous week). Hues selected were intense colour as opposed to tonal.

Themes. Urban & Undergrowth (greens, browns, earth colours)
Moonlit Skies (violets, pinks)
Burning desire (warm reds, oranges)
Refreshingly glacial (transparencies) (pale blues, whites)

Method. The student started with the four elements as an overall theme; Earth, Fire, Water, Wind (air) then collected images. The themes were then renamed for originality and effect. Keywords were then decided upon relating to the images to convey the mood. Colours were selected from the imagery.

6.3.4.2 Student 2.

Progress. On week 3 the student came prepared with ideas for the presentation of the package and was in the process of scanning images to use computer generated story boards. Collected images, trims, fabrics, etc., By week 4 the student continued to work on developing the colour palette. Inspiration came mainly from fabrics and imagery collected. The student had also experimented with paint media for colour precision. Some thought had been given to colour names. The student continued to source fabrics, and tried to match colours to those selected, this created problems. To resolve this the student thought that the colours may have to be altered slightly to accommodate the colour of the fabrics available. The student was at this stage still unhappy with some of the theme titles.
Themes. Twilight (mystical colours, violets, navy’s, emerald green)
Daybreak (pastels, clean colours)
Golden sun (golds)
Sunset (reds, oranges, pinks)
The colours of the gold theme entitled Golden Sun were extended to include golds, oranges, greens, browns, flesh tones, bronze tones. The student was not happy with the theme title, but had thought of using gold as a prefix to each colour name in the theme, i.e. yellow gold.

Method. The student was directed by the images collected that were appealing. Suitable themes were then decided, while all related to the sky, the student did not appear to be conscious of this connection.

6.3.4.3 Student 3.

Progress. The student had decided upon a company name and logo. Developing computer generated boards. Only three themes were decided upon, two of which the student felt needed to be updated. Lifestyle was the key inspiration; purity, innocence of the spirit through to wild, free spirited experienced adult. Working on computer generated images. Boards developing and a company logo decided upon. Still brain storming theme name ideas and developing the colour palette. The student had collected unusual fabrics, little development on the project.

Themes. Easy Spirit – beauty / harmony. (blues, mint, pale pinks, champagne)
Bohemian (look) - (brighter, warmer colours)
Wild child (no colour palette)
No 4th theme as yet.

Method. Inspired by paintings, clothing, images collected, interior design. Collected images, fabrics, etc. Selected images, concentrated on the lifestyle aspect.
6.3.4.4 Student 4.

**Progress.** The student decided on a target market and had thought about presentation layout. Thinking of titles. Overall theme to fit market niche (children's wear). Researched children's garments in magazines. Developing style illustrations. Lots of images collected. Used the computer for development of story boards. Logo ideas. Sourced papers for the boards. Worked on the moods. Struggled on key words. The student continued to work on the computer and to source background papers for the boards. A colour palette was in mind from the imagery collected. Collected fabrics to take colour from rather than the other way around due to problems encountered matching up colours.

**Themes.** Candy (pastels)
Cookie (warmer colours)
No 3rd theme as yet
No 4th theme as yet

**Method.** Images collected, including gift-wrap which was the prime source of inspiration. Colours developed from the images.

6.3.4.5 Student 5.

**Progress.** The student used the computer to generate boards. Collected images and continued to work on developing themes. Generating a colour palette on the computer and developing a sketch book. Sourced fabrics and worked on sketches.

**Themes.** Not yet decided upon.

**Method.** The student's inspiration came from certain desired images for each theme.
6.3.4.6 Student 6.

**Progress.** The student was inspired by the 1960's and 1970's underwear. Changed ideas of themes due to lack of supporting imagery. Still developing the colour story and key words.

**Themes.** Not yet defined. Though the student had ideas from the imagery collected. Planned to include natural, pastel colour story in fine fabrics. Ideas for a colour palette for nightwear theme in mind but lacked imagery.

**Method.** Images collected inspiring some colours. Other ideas of colour to coordinate with the theme in mind but no imagery collected.

6.3.4.7 Student 7.

**Progress.** The student had collected images and decided upon relevant theme titles. Colour palette developed from the imagery. Now looking at moods/ lifestyles of the consumer and deciding upon keywords. Thoughts of redefining the theme titles.

**Themes.** Something deep inside (negative colours, black) (swimwear)  
Express with colour (brights, reds, primaries)  
Classic innocence (clear pastels)  
The Sculptress (greens, neutrals, blues)

**Method.** Images inspired themes and colours.

6.3.4.8 Student 8.

**Progress.** The student had thought about an overall theme incorporating four themes. Four seasons were decided upon, though new theme titles were considered necessary.
Themes.  
Autumn (neutrals)  
Spring (greens, yellows)  
Winter (violets, blues)  
Summer (pinks)

Method.  Images and yarn wrappings collected. Inspired by interior design.

6.3.4.9 Student 9. 

Progress. Four seasons also decided upon, but changed to different countries/ cultures. This became the main inspiration. Changed themes due to lack of imagery sourced. Thought of moods as themes. The student was still developing themes, finding imagery and deciding the colour palette.

Themes. Content (pastels)  
Melancholy (black, blue, grey)  
Confused (brights – off beat – dark brights)  
Excited (brights)

Method. Collected images inspired by the selected theme.

6.3.4.10 Student 10. 

Progress. The student claimed to have ideas but had not started collecting. Inspired by climate and animals originally inspired by the 4 elements, developed into climates/animals linked to the elements, i.e. fire – dessert. Still not decided upon all four theme titles. Taking colour from animal imagery. Deciding on key words.

Themes. Coral reefs – water - sequins  
Country – furs  
Dessert – scorpions, lizards – leather.  
4th theme not yet decided.
Method. Inspired by a preconceived theme.

6.3.4.11 Student 11.

Progress. The student had decided upon a marketing niche and to use periods of time as themes. One theme was Edwardian costume, but changed due to the lack of imagery sourced. Collected fabrics. Style ideas. Thinking of possible theme names – revival, revolution, reincarnation. The student had developed a colour palette and working on key words/ relevant fonts. Had sourced fabrics and continued to develop style ideas. Experimented with different media. Thinking about the presentation of the package.

Themes. 1920’s (dark tones)
World War I
French Revolution – romance – (dark colours)
1930’s (flesh tones)

Method. Overall theme decided upon, time periods. Renaming themes.

6.3.4.12 Student 12.

Progress. Sourced fabrics and developing colour palette though no themes had been decided upon.

Themes. Brights
Darks, browns, reds, sunset, purples lingerie / nightwear
Pastels pinks, greens.
Neutrals.

Method. Used colour as the main inspiration.
6.3.4.13 Student 13.

Progress. Originally decided upon the four seasons, decided to change. Sourced fabrics, thought about the overall package design.

Themes. Rich (warm colours)
Raw (neutrals) - furs
Rustic (greens, yellows)
Spa (blues, blacks)

Method. The student was directed by preconceived ideas for themes.

6.4 The students working methodology.

The following pictorial results of the students working methodology show how each student approached the same task in a variety of ways. Table 1, page 129, shows the tools used by each student in their initial approach to the task.

Key.  = Thought.  = Practical action.

6.4.1 Student 1

Overall theme 4 themes
Collected images Colour palette
Re-named themes
Keywords

6.4.2 Student 2

Collected images, fabrics, trims, etc
Selected appealing images Colour palette
Themes Colour names
Continued collecting fabrics etc.
Refined colour palette
6.4.8 Student 8

Overall theme & 4 themes

Refined titles

Inspired by interior design

Collected images, yarn wrappings etc.

Colour palette

6.4.9 Student 9

Overall theme and 4 themes

Changed themes

Collected images

Further development on themes

Changed themes again

Further image sourcing

Colour palette

6.4.10 Student 10

Themes

Ideas on fabrics required

Coloured, fabrics, etc.

Refined themes

Colour palette

6.4.11 Student 11

Market niche

Overall theme and 4 themes

Problems sourcing images

Refined themes

Collected fabrics, etc.

Colour palette

Titles

6.4.12 Student 12

Collected fabrics

No themes decide yet.

Colour palette main inspiration

Colour palette

6.4.13 Student 13

Overall theme and 4 themes

Changed themes

Collected fabrics, etc.

Theme and colour ideas

Overall package design
### Table 1

<table>
<thead>
<tr>
<th>Student</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tr>
<td><strong>Tools</strong></td>
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<td>Awareness</td>
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<td>Observation</td>
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<td>Intuition (initial inspiration)</td>
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<td>Thought / decision / reasoning processes.</td>
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<td><strong>Objective</strong></td>
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<td>Data – Imagery</td>
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<td>Data – fabrics etc.,</td>
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<td>Previous trend info.</td>
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<tr>
<td>Colour cards.</td>
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<tr>
<td>Experimenting with media.</td>
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</table>

**Key.**
- = Tool not used by the student.
* = Subjective tool used by the student.
** = Objective tool used by the student.

Table 1 above shows which of the available tools each student used. None of the students articulated or demonstrated that they had used awareness and observation skills, i.e. being aware of the colours currently available on the high street and colours dominantly worn by the general public at the time. While this observation technique had been pointed out to the students in the first week, the importance, it would appear was not evidently understood by the students.

Intuition plays a part generally in the thought and decision processes, though here in the table it represents the development of initial inspiration. 76.9% of students developed their initial inspirations for theme ideas in an intuitive manner. All but one student demonstrated the use of thought, decision and reasoning processes in this early stage. This may have been due to this particular student taking longer than the other students to approach the task in hand.
All but three students had started to collect data at this stage, either by random collection to use as inspiration for themes/ideas or by selective collection to fit into preconceived ideas of themes.

53.8% of students at this stage were collecting fabrics etc. again either randomly or selectively. None of the students had demonstrated using previous trend information, even though they had been introduced to this facility during the first week of the module. Only one student showed evidence of collecting colour cards for assistance in colour selection. Within the forecasting sector such a tool would be used such as the Pantone range.

15.4% of students experimented with paints and other media in order to attempt to match colours to imagery for use on the mood boards and presentation packages.

6.5 Findings

The information obtained from the observation exercise suggested two basic elements of the process of developing a colour story; that of thought and that of available resources which are either used to support ideas or used as sources of inspiration. An infinite number of thought and resource information processes can be utilised before the colour story is complete. This observation of methodology was recognised and researched by Newell & Simon, 1972 (Van Someron, et al, 1994). They discussed the formulation of a ‘psychological theory for problem solving’, recognising a

"Sequence of steps, each of which changes the knowledge that a person has about the problem in hand. When problem solving starts only the problem givens are known. This is the initial problem state. Knowledge is applied that changes this initial state. In general it adds something to the initial state. Problem solving ends when the solution is known."

Page 98.

Figure 15 overleaf shows the application of the above statement to the development of a colour story for colour forecasting.
Figure 15. A pictorial interpretation of Newell & Simon's psychological theory for problem solving applied to colour forecasting.

6.5.1 Stage one.

Stage one sets out the initial problem state, in the case of the development of a colour story for colour forecasting for the students this was set out in the brief, section 6.3.2. In the case of the working forecaster the brief could be simply the season for which the prediction/colour story is required. Other requirements may include new or revised target markets or updated presentation packages to meet client demand, ease of use, combating competitors etc. The professional forecaster would automatically be armed with the soft, subjective tools. It was felt that the students should be made more aware of these tools and encouraged to use them, otherwise their design ideas could become isolated and not fit in with the marketing considerations.

Figure 16. The professional forecaster at stage one, data collection.
The initial problem state and the knowledge already attained relating to the problem provides the initial inspiration for approaching the task in hand. It was found from the case study that this initial inspiration can be directed either by thought; previous knowledge, or by visual stimuli. The professional forecaster would appear to use a combination of these two factors, as established in Chapter 3. The percentage of these factors may relate directly to experience obtained over the course of time working in this field. It may therefore be difficult to assess and define how many of each of the relevant tools are used in practice. Evidently within the profession a continual database is kept either as hard copies or mainly in the forecaster's memory or most likely a combination of both. This database would include thoughts, experiences, ideas, and actual colour in a variety of media including fabrics. Ideally all of this data would be catalogued to be retrieved at any time by anyone: regrettably this is not so.

![Diagram](image)

**Figure 17.** Initial problem state, stage 1. - Initial Inspiration.

It was found that 61.5% of the students used thought as their initial inspiration, of which 87.5% started with previous knowledge as the basis for their thought processes. 38.5% used visual stimuli as their initial inspiration after a random collection of data. All students used their intuition as the basis for filtering the information into themes.
The initial inspiration may be thought or visually inspired, though once the thought, decision and reasoning processes begin and a direction or idea is decided upon, then further data collection and thought processes will become more controlled and more defined. However, even in the process of collecting data in a more controlled manner, there is the possibility of finding a random source of inspiration that may eventually be rejected or used to replace an existing idea. It is therefore the thought, decision and reasoning processes that filter out the eventualities and bring together a satisfactory end state. The visual stimuli that came about either as initial inspiration or as supporting evidence dependant upon the route i.e. thought or visual data inspiration, eventually becomes supporting evidence that initiates and promotes the colour story/colour prediction.

Figure18. Operators.

Reasons for this second stage of the process are numerous and varied. Findings from the student case study revealed some of these operators to be instigated by problems such as finding controlled data to support an idea where revision of theme ideas was necessary or random data collection at this stage promoted a new idea.

Intuitive thoughts assisted in redefining ideas. Difficulties in matching fabrics to colour ideas from imagery induced revision of ideas. Lack of imagery found to support ideas.
6.5.3 Stage three.

Stage three is the finished product. This may be the colour story boards that members show at the colour meetings or completed trend packages that the forecasting company sells to clients. In case study one, this was the mood boards and trend package produced by each student for the final assessment.

6.6 Summary of case study one

This case study was based upon naturalistic observation, a methodology discussed in section 5.3.2.1, where the subjects are observed working within their natural environment, as students were observed in the classroom. However, they were not observed actually working on the task, as this took place during the students’ self-directed learning periods. Therefore, only the work produced and shown and the audible information given by the students was observed and recorded during the workshop period. The quality of the recorded data relied upon the accuracy of the students’ reiteration of the process they had undertaken. This was somewhat unreliable.

6.7 Case study two.

A more controlled exercise was developed to uncover task methods and thought processes in the development of a colour story with a second set of students. A sample of thirty five postgraduate students were randomly arranged into seven groups of five. Each group was given an identical pack of information and set brief to work from. Before hand, the students were given a short insight into how the colour forecasters develop their colour stories for a given season. Each group found an appropriate place to work on the task, away from the classroom. One hour was allowed to complete as much of the task as possible. One student member of each group acted as secretary, recording the audible discussion verbatim. Each group member was allocated a letter A to E to be identified by. This procedure not only assisted the speed of recording information for the secretary, but also ensured student confidentiality.
6.7.1 Pack contents.

Each identical pack contained the following:

* The brief.
* Photocopies of the make believe forecasting company’s previous trend mood boards.
* Photocopies of the make believe forecasting company’s previous colour palette.
* Nine selected photocopies of visual imagery.
* A set of Pantone colour cards.
* Stick on labels lettered A to E.
* Five sheets of lined paper.

6.7.2 The brief.

Role Play Exercise.

Thought Processes are to be accurately recorded throughout the exercise.

You are a design team working for a colour consultancy company. Your task today is to formulate colour palettes and story boards for your company’s prediction package for the forthcoming season.

Using the information given as a basis for your company’s predictions. You will need to discuss and decide upon the following criteria:

* An overall theme / title.
* Four individual stories within the main theme.
* The mood you wish to project for each theme and possibilities for images which would reflect those moods and key words.
* The colours for each story, (using 6 to 8 colours for each story).
6.7.3 Tools available.

The tools available to these students were similar to that of the students of case study one; awareness, observation, intuition, thought, imagery, previous trend information and colour cards. The differences were that in the first instance, the students of case study two were unaware of the exercise they were to be conducting before hand and that the time allowed for each case study was drastically different. Therefore awareness and observation of the high street and general public had to come from memory, whereas students from case study one were able to conduct this task over a number of weeks.

The imagery provided for case study two was limited and the students were unable to source their own images. Mock previous trend information was provided for case study two students, it was left to case study one students to source this type of information themselves. Pantone colour cards were provided for case study two students but not for case study one students. These differences were due to the fact that case study one was an observation of a real module, whereas case study two was a carefully prepared exercise.

6.7.4 Method.

The articulated thoughts of all members within each group were recorded by one of the group members. This information was used to establish the approach of each group to the task in hand. The method itself was an improvement on case study one as the thought processes were recorded to some extent, whereas in case study one, it was left to each student to remember and articulate their thought processes. However this method was still not ideal as it relied upon one group member recording, verbatim, fellow group members words.

Not all groups worked with the same level of enthusiasm and it appeared that not all members actively voiced their thoughts. These problems were recognised by (Van Someron et al, 1994) where the think aloud method was developed as a tool for understanding thought processes using a video recorder.
While the method does not rely upon a group member to record the group discussion, still not all members would be willing to actively participate, in fact it may even discourage more members from co-operating.

6.7.5 Student methodologies.

The students working methodology is depicted below and overleaf in pictorial format as for case study 1.

6.7.5.1 Group A  
6.7.5.2 Group B

6.7.5.3 Group C
6.7.6 Group participation and student input.

There were an infinite number of statements that could have been recorded from each group member relevant to the discussion to complete the task. Group D did not appear to comprehend how their thought processes were to be recorded even though they had been briefed exactly the same as all the other groups. Therefore it was not possible to include this group in this section of the findings. It was however possible to understand the approach the group used to solve the task problem as this information was recorded, just their thought processes were eliminated.
6.7.6.1 Table 2

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of statements recorded.</th>
<th>Student input A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>24</td>
<td>29%</td>
<td>21%</td>
<td>29%</td>
<td>21%</td>
<td>0%</td>
</tr>
<tr>
<td>B</td>
<td>75</td>
<td>21%</td>
<td>36%</td>
<td>21%</td>
<td>15%</td>
<td>7%</td>
</tr>
<tr>
<td>C</td>
<td>27</td>
<td>41%</td>
<td>18.5%</td>
<td>18.5%</td>
<td>22%</td>
<td>0%</td>
</tr>
<tr>
<td>D</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>E</td>
<td>48</td>
<td>10%</td>
<td>21%</td>
<td>8%</td>
<td>42%</td>
<td>19%</td>
</tr>
<tr>
<td>F</td>
<td>81</td>
<td>25%</td>
<td>33%</td>
<td>10%</td>
<td>13.5%</td>
<td>18.5%</td>
</tr>
<tr>
<td>G</td>
<td>11</td>
<td>45.5%</td>
<td>45.5%</td>
<td>0%</td>
<td>9%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Where student participation is 0\% it is not unknown whether or not that particular student was present or just inactive in the task.

6.7.6.2 Table 3

<table>
<thead>
<tr>
<th>Group</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referred to the brief after the initial reading.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Referred to previous trends / colours.</td>
<td>-</td>
<td>-</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>*</td>
<td>-</td>
</tr>
<tr>
<td>Looked at or used imagery</td>
<td>-</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>*</td>
</tr>
<tr>
<td>Used Pantone colour cards.</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Developed:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall theme.</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>_</td>
<td>*</td>
<td>-</td>
</tr>
<tr>
<td>Four themes.</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Colour palette.</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Key.

- = Not used by the group.
* = Actions taken by the group.

Again the students worked with initial inspiration derived either through thought or by using the hard data provided.
6.8 Problems encountered.

As previously stated in section 5.7.4 problems were encountered with the chosen methodology. In addition to these, other problems included the fact that activity amongst the groups was unobserved and that therefore the written text was the only record of the discussion. This provided the added problem of deciphering the handwriting of the secretary. The basic methodology employed by the group was not always easy to identify. Some of the thought processes recorded were irrelevant to the task.

The concept of video recording another controlled exercise was considered, though problems could still be encountered such as the behaviour of the participants as video recording is considered by many as an invasion of privacy and can result in unnatural behaviour. The recording then requires to be accurately transcribed into written format, this can promote problems such as summarising the data out of its original context, loss of essence and assumption on the part of the transcriber. Again not necessarily would all thought processes be spoken. (Van Someron, et al, 1994)

6.9 The balance of art and science for colour forecasting.

The aim of education should be to produce employable graduates within their field of study. The process of forecasting was established in chapter 3 as having a balance of art (creativity) and science (practicality). But should this balance actually be required to be equal in reality. Can a more artistic and intuitive based approach be more successful than that of an equal balance. Similarly, can a more scientific approach be more successful. Is the art element more applicable to the presentation of the colour story rather than its actual development.

![Figure 19. Balance of art and science.](image-url)
### Table 4.

<table>
<thead>
<tr>
<th>Balance of subjective and objective tools</th>
<th>Equal</th>
<th>More subjective</th>
<th>More objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case study 1 students.</td>
<td>15.5%</td>
<td>69%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Case study 2 student groups.</td>
<td>43%</td>
<td>28.5%</td>
<td>28.5%</td>
</tr>
<tr>
<td>Total</td>
<td>25%</td>
<td>55%</td>
<td>20%</td>
</tr>
</tbody>
</table>

### 6.10 Summary of results

It was found from the results of the students methodologies that more students had used a combination of more predominantly subjective tools coupled with a lesser proportion of objective tools. This finding reiterates the point previously established that the process of colour forecasting is very much one of a subjective and intuitive nature, within the profession, as taught and it would appear, naturally adopted by the students that were observed.

Each student participant of case study one and each group of students of case study two demonstrated the ability to produce colour stories in varying amounts of time and with differing sources of initial inspiration. However, the important factor remains; do the predicted colours relate to consumer demand or preference. After all this is the whole purpose of the forecasting phenomenon to create sales on the high street, if this does not occur, then the concept of forecasting is not a viable tool to the fashion and textile industry in its present state.

The proof of the validity of the predicted colours therefore lies within the testing of consumer demand/preferences in comparison to the colour palettes developed.
6.11 Summary.

In this chapter the working methodology of the forecaster was further investigated through the design, development and application of two case studies.

An observation was made to evaluate the teaching methods of the colour forecasting process to students and the students understanding of this process and its importance in the industry. It must be considered that there is a great opportunity for improvement in this area of study and that the inclusion of colour knowledge would be advantageous and of benefit for the students.

It is felt that further developments of the methodologies used for the observation exercises would benefit greatly from refinement for further and deeper understanding of the thought, reasoning and decision making processes involved in the selections of colour for the colour ranges developed.

Overall, the process of colour forecasting was found to be more of a subjective nature than objective in reflection of the current teaching methods and the students understanding of the process. The following chapter introduces the reader to soft systems methodology and its application to modelling the colour forecasting process.
7.

Modelling the

Colour Forecasting process.
In chapters 5 and 6, the methodologies available to forecasters for the development of a colour story were discussed and the implementation of some methods employed by participants of the two case studies. This chapter attempts to develop systems models of the colour forecasting process. A proposed ideal model deduced from the conceptual thinking in this will be compared with a model of general practice currently employed throughout the fashion and textile industry. This will be approached using soft systems methodology.

7.1 Soft systems methodology.

Soft systems methodology (SSM) has become a widely used tool for investigating and better understanding human activity situations. It evolved from an earlier systems engineering approach conducted by Professor Peter Checkland and his associate Scholes at Lancaster University, and has since been pioneered by Checkland. While Checkland and other co-writers have published many books on the subject and its application, a more simplistic text was published by David Patching (1990), which has been used as the basis to the approach of investigation for this chapter.

The methodology is based upon seven identified stages that can be used to appreciate and understand a subjective problem or situation holistically. While each stage is important in its own right, it is not necessary to complete each stage fully before continuing on. It is possible, and indeed desirable to keep returning to particular stages in order to impose clarity to the situation as a whole. To reiterate the quotation previously used in 5.3.3, Jorgensen's definition of participant observation as an "holistic examination of phenomenon – avoiding separation of components to describe comprehensively and exhaustively a phenomenon in terms of a research problem", would also give credence to the appropriateness of applying soft systems methodology to the problem of better understanding the colour forecasting process.
The system has a specific language that needs to be understood by the system user. Both the terminology and the system methodology will be explained throughout the chapter while at the same time applying it to the problem state.

7.1.1 Conceptual system types.

(Patching, 1990) discussed four conceptual system types; natural, designed, social and cultural, and human activity systems. A natural system naturally occurs in the world and universe, which would for example, include humans, animals, the galaxy. Designed systems are products of mankind such as technology, computers, engines, and also the abstract entities such as, mathematics, art, and philosophy. Social and cultural systems are formed by the togetherness of humans such as families and communities. The fourth system, human activity, would incorporate the former three categories and achieve a purpose, such as understanding the process of colour forecasting. Figure 20 below is a simplified version of the figure given by Patching, page 9.

![Diagram of conceptual system types]

Figure 20. A simplified interpretation of Figure 2.1, (Patching, 1990) page 9.

Soft systems methodology is applicable to the human activity systems category.

"A human activity system is only a concept and the form of the associated model will depend on the viewpoint selected by the analyst..... provides an excellent basis for both understanding what is happening in practice, or what should be happening to achieve some desired end.”

Page 9.
7.1.2 The soft systems model.

The concept of soft systems methodology makes use of two key aspects; the problem as understood in the 'real world' and in the 'systems world'. Analysis and conclusions from the latter are then brought back into the 'real world' with a more substantial understanding of the problem and thus, possible routes to the solution. Figure 21 below shows the diagram given by (Patching, 1990) page 41.

![Diagram of soft systems model]

**Figure 21.** Reproduction of figure 4.1 (Patching, 1990) page 41.

The first two sections of the methodology apply to the real world scenario of the problem, as seen by the analyst. This incorporates the information previously sought to understand the problem, in this case to understand the process of colour forecasting. This is achieved through a key tool of SSM; rich pictures.
7.1.3 Rich pictures.

Rich pictures are cartoon like drawings or sketches, showing the different aspects of the problem to be analysed pictorially. A series of drawings may be produced and later sanitised to remove any offensive material prior to presentation. By collating individual drawings together a rich picture of the situation holistically can be produced. While a time consuming exercise, it is a worthwhile approach and satisfying to the creative analyst. This holistic picture then serves as a tool to uncover the tasks and issues to be investigated.

7.1.4 Working with the SSM model.

The systems world provides a place where the analyst can go to in order to experiment with the data and conceptualise a structure to an otherwise unstructured situation. This allows the use of soft tools also used by the colour forecaster; intuition, inspiration and insight, entering the worlds of the subconscious mind and even possibly, the super-conscious mind; previously referred to in section 5.7.1.1 as the universal mind, and is considered to be inspirations. On entering the realms of the subconscious mind, information received is more irrational, illogical and invariably without explanation until sufficient information is obtained and collated in the realms of the conscious mind. Ideas float around in the mind until a structure can be identified and subsequently quantifying the information when brought back into the realms of the real world. As established in chapter 5, subjective concepts are only widely accepted when supported by hard data to validate its credibility. SSM was used to attempt to give more credence to the colour forecasting process.

The problem situation unstructured (Stage 1) and the problem situation expressed (Stage 2) are related. Both require a database of historical information, as obtained in previous chapters and used here to identify the problem through rich pictures. These two sections show how the problem came about in the real world. An analytical process is used to define and describe the problem in a clear format. The actors are introduced and their relevance to the situation defined. These two sections should depict a holistic overview of what is currently happening in the real world as perceived by the analyst. The analyst here refers to the person or persons working with the problem situation with intent to offer a proposal for improvement (Patching, 1990).
7.2 The problem situation unstructured (Stage 1)

Checkland once stated that a problem or a problematic situation could be defined as;

"any situation in which there is perceived to be a mismatch between what is, and what might, could, or should be."

(Patching, 1990) Page 44.

This statement would perfectly sum up the colour forecasting process in the eyes of the researcher. From the background information presented in chapter 2, it was evident that the concept of colour forecasting is essentially a service to the fashion and textile industry. To enable manufacturers to make the correct colour choices for their products to be saleable and provide a profit. However, it is also evident that a potentially important source of information is not as yet tapped into, i.e. that of market research, investigation and understanding of the consumer preference, desire and need. This reflects the mismatch between what is and what could or should be.

Unstructured, is essentially the initial perception of the problem situation in the early stages of the investigation. Chapter 2 established the need for colour forecasting for the fashion and textile industry. The main points are reiterated here.

Pre twentieth century, the driving force of fashion was found to be that of social class and status. The distinction of social classes was easily demonstrated through fashion. Until the industrial revolution, fabrics were the main distinguishing factor, as many textiles were imported and therefore expensive. The cheaper fabrics produced in Britain were of poor quality but affordable to the mass population. These fabrics were available in a limited colour selection. Throughout the industrial revolution the ability to produce higher quality yarns and fabrics cheaply was evident. This made quality fabrics more readily available to the masses. As demand from the higher classes to be recognised as so, heightened, the class distinction became evident through more intricate style. Colour had once played a key role in class distinction, but by the mid nineteenth century the development of the synthetic dye industry defused this situation.
Pre industrial revolution.

Many textiles imported to designers.

Fashion for the Wealthy.

Close links between designer & client.

Hand made garments for the masses.

British hand made yarns & fabrics.

Driving force – Consumer. Initiated by social class status, supported by the textile industry.

Figure 22. The driving forces of fashion pre industrial revolution.

Industrial revolution to the end of the nineteenth century.

Cheaper textiles more readily available to the masses.

Driving force – Consumer. Still initiated by social class status, now supported by style, cut and fit.

Cheaper garments more readily available for the masses.

Fashion and textile industries working closer together.

Figure 23. The driving forces of fashion during the industrial revolution to the end of the nineteenth century.
The now newly thriving textile industry felt the need to source inspiration for their products. This was particularly found to be evident from around the 1820's when manufacturers began to visit the USA, as their ready to wear industry was then more advanced than in Britain. Later, as the haute couture industry in Paris established itself, this too became an important source of inspiration for garment manufacturers.

By the early 1820's, British Manufacturers visited USA for inspiration.

By the end of the Nineteenth Century the Haute Couture Industry in Paris had established itself as a prime source of inspiration for style and colour.

**Figure 24. Early inspiration sources.**

By the beginning of the twentieth century there was a distinct relaxation of social classes. The textile industry in Britain had become well established and the fashion industry was developing its importance through the development of the ready to wear industry, catering for the masses. During this last century many sports, hobbies, interests and careers have given rise to individuals adopting extremely varied lifestyles. This gave rise to the demand for fashionable leisure/sportswear, work and casual wear.

**Turn of the twentieth century.**

As the ready to wear industry grows, the lack of communication between the designer and the consumer increases.

Textile industry established.

Driving force - Consumer, initiated by the ready to wear garments affordable by all.

Fashion more readily available to the masses.

**Figure 25. The driving forces of fashion early twentieth century.**
As the designers within the industry do not work on a one-to-one basis with clients, there is no direct communication link between the industry and the consumer. As this lack of communication increases, manufacturers become less informed of consumer needs. This concept evidently became recognised and by the third decade of the twentieth century, a small number of forecasting companies were established in Britain following in the footsteps of the USA.

By the early 1930's seasonal colour palettes were beginning to become an important directive for trend information. This concept somehow appears to have become lost during the subsequent forty years, possibly with the demise of the originating company of the concept, The British Colour Council.

After the disruption of WWII, the fashion and textile industry began to be re-established along with both the haute couture and ready to wear industries. By the 1960's more money was readily available to the younger generation giving more spending power. Exuberance reigned and the industry boomed. This was followed by the recession of the 1970's, when less dispensable money was available and costly mistakes were made by the industry, referred to as fashion flops, causing a slump in the industry.

The concept of fashion being consumer directed became ever more evident and important. More forecasting companies were established during this time and marketing strategies became more important for company survival. As the recession lifted, the consumer lifestyle aspect became ever more varied. As marketing techniques rose to this challenge the industry was ever more in need of precise consumer colour demand information, particularly within the primary market sector, the fibre, yarn and fabric manufacturers.

Following the lead of the fashion company 'Next', colour established itself as a key marketing strategy and a more important driving force of fashion. Forty years after The British Colour Council's initiation of seasonal colour palette development, this concept now became a key role in forecasting. However, it is considered that the forecasters may still be guilty of influencing colour direction as opposed to anticipating it. Is consumer demand for colour really sought and recognised or are the forecasters still presuming our demands and preferences or deliberately trying to direct them.
Observation of the end of season sales on the high street would suggest that the consumers needs are still not successfully met. This may be due to the fact that observations of consumer desire by the forecasters reflect colours already available. One can not observe the general public wearing colours today that are not readily available to purchase.

Present day.

Figure 26. The present day driving forces of fashion.

7.2.1. The actors.

It is also a requirement of the methodology at this stage to identify not only the problem situation, but also who essentially owns this problem and the actors involved in the process. Checkland proposed that the analyst can be identified as the problem owner, along with any other person(s) who will effectively benefit from any improvements made to the process as a result. Patching proposed that the employer of the analyst is the real problem owner and the analyst is the problem solver.
In the case of the colour forecasting process, the problem owner could be identifiable in any sector of the industry that is involved in the colour forecasting process. This is demonstrated in figure 27 below, showing the actors in each section of the industry who work with the colour forecasting process from the initial concept (the original colour forecasters) through to the consumer of the end products.

![Diagram of the colour forecasting process](image)

**Figure 27.** Identifying the actors who use the colour forecasting process.

At the initial stage of the colour forecasting process there are those who provide the service to the industry collectively known as the colour forecasting companies. Thereafter the information users become involved at reducing levels, starting with the fibre, yarn and fabric producers, followed by the garment manufacturers and finally the retailers. The actual actors are those responsible for their company’s colour choices for their own products, these may include designers and product buyers. Large companies may have a team of people that work together to compile their colour stories. Smaller companies may have only one person responsible for this procedure, usually the designer.
The first level of information users are the fibre and yarn manufacturers who supply the fabric manufacturers and knitwear companies. The fabric manufacturers supply the garment making industry. Both the knitwear companies and the garment manufacturers supply the retailers. The fibre and yarn manufacturers use the colour forecasting information to help them to compile their own prediction packages in the form of shade cards, sales data may help to influence their choice of colour selection. Invariably, members of major company's colour teams as previously discussed in 3.2.1 are regularly in attendance at the national and international colour meetings.

Fabric and knitwear manufacturers use both colour forecasting information and fibre and yarn company shade cards to direct their colour directions. This information is well disseminated through trade exhibitions attended biannually, as previously discussed in 3.2.1.2. Garment manufacturers also utilise all of this information. Retailers often make use of forecasting information along with information disseminated through trade fairs. They may also make use of previous sales data particularly large companies using EPOS (electronic point of sale) systems, though this would be down to individual companies. No evidence has been found to substantiate that this actually happens with regard to colour data collection nor any indications of who would be responsible for the analysis of the information once obtained.

The consumer may be influenced by colour trends promoted via marketing strategies through magazines and television, but do not have access to the trade forecasting information. It is the consumers however, that influence the effectiveness of the colour forecasting predictions by their decisions of purchase. The consumer, it is claimed, is observed by the initial colour forecasters, therefore involving them in the process albeit covertly.

7.3 The problem situation expressed (Stage 2)

In order to develop this stage a large database of information surrounding the problem is necessary. The background information of chapter 3 was used for the development of this stage. There are basically two types of perception of the colour forecasting process identified, those of a positive nature and those of a more negative nature as shown overleaf in figure 28.
Figure 28. The positive and negative perceptions of the colour forecasting process.

A positive viewpoint of the colour forecasting process is; a tool used by a specialist service sector to provide accurate trend prediction information to the fashion and textile industry that aims to enable the user to accurately anticipate consumer colour preferences for a predetermined season in the near future. Thus enabling the industry to manufacture desirable coloured products for the benefit of the company and the consumer.

A negative viewpoint is; a concept used by a relatively newly formed service that exploits both the fashion and textile industry for financial benefit and the general public by its attempts to direct preferences using clever marketing ploys. This negative viewpoint is an extreme view but could be unintentionally happening though the real intention of the colour forecasters could be the positive viewpoint. A high volume of sales will support the forecasters ability of getting it right, instilling confidence in the service. Low sales volume on the high street will inevitably work against the credibility of the forecast predictions, promoting discouragement of the service and the process.
In reality, it is probably a combination of the two perspectives. The positive, tangible, objective tools instill confidence, but the less understood subjective tools promote suspicion. Marketing promotes optimism, but the low volume of sales on the high street promotes pessimism. If the softer or subjective elements of the process were better understood and the forecasting process as a whole demonstrated a higher success rate, then this would be a more advantageous tool for the industry to use. The problem therefore could be expressed as the colour forecasting process being a tool that provisionally has potential to assist the fashion and textile industry to thrive but is currently little understood and as yet under-developed and consequently under-estimated.

(Brannon, 2000) stated *forecasts predict the mood, behaviour and buying habits of the consumer.* It was found evident that consumer lifestyles are much investigated and that their importance recognised as a key marketing technique. However, what of colour preferences? Consumers can only chose to buy or not to buy the products that are on offer at that moment in time. A ripple within the industry at present revolves around the concept of the manufacturing of mass individual consumer products, i.e. mass customisation. Whether the concept is a viable one or not is not the issue here, but it does reflect the possibility that the industry is not completely satisfied that the forecasting service is as accurate in its predictions as maybe desirable. This is crucial to the profitability and survival of the industry.

### 7.3.1 The responsibility for colour direction

Initially it would appear that the onus for the responsibility for the direction of colour has inevitably been put upon the shoulders of the primary marketing sector; the fibre, yarn and fabric manufacturers. These are the actors who produce the colours of the raw materials that the rest of the fashion and textile industry use for the manufacture of their products. Yet the retailers invariably have more access to information for the identification of consumer buying behaviour and selection preferences through sales data, observation and verbal communication on the shop floor. Four levels are identified in the figure below showing the usage of colour forecasting information at the different production areas of the industry. Historically, level 1 was originally incorporated within level 2, until such a time that forecasting companies were established to relieve the primary market sector of the growing complexities of the forecasting process.
The forecasting service evolved to relieve the industry of this important process.

Fibre, yarn and fabric manufacturers are generally considered to be responsible for colour. Historically, they performed the forecasting process themselves, prior to the establishment of the forecasting service.

Garment manufacturers rely heavily upon the fibre, yarn and fabric manufacturers to produce raw materials in colours consumers will desire.

Retailers rely heavily upon the garment manufacturers to produce garments in colours the consumer will desire.

Consumers hope / expect retailers to offer products in colours they desire.

**Figure 29.** The use of colour forecasting information within the fashion and textile industry.

### 7.3.2 The missing link

While the driving force of fashion has always been and still is directed by the consumer, the economy of the industry also has a bearing upon fashion, or at least upon the increased speed in the rate of change of fashion, in order to continually produce at a profit. Due to the intricacies of production costs, colour is an easily changeable factor of fashion. Colour has therefore become a very important element of the driving force concept and a powerful marketing aide. Sales have become somewhat dependent upon seasonal colour stories. Colour therefore has a substantial role to play in the fashion and textile industry.
The consumer influences the validation of the colour forecast predictions, and is a potential source of information to be obtained through consumer market research. This area appears to still be relatively unexplored.

Figure 30. The missing link – consumer colour preference information.

7.4 Root definition (Stage 3)

The root definition is the analyst's statement derived from the initial research of the activities and aims of the system. At this stage the SSM process leaves the real world scenario and goes into the realms of the systems world. This is where the analyst defines the most appropriate viewpoint of the situation through the use of the root definition. This essentially reflects the aims that the process wishes to achieve. Another tool is introduced here for application to this process, that of the CATWOE test, defined later in 7.4.2. This tool assists the analyst in the construction of the root definition. The root definition may be written, re-written, defined and redefined many times before a satisfactory statement expressing the problem situation is clearly achieved. The root definition indicates the minimum number of activities that exist in the system and identifies the task in hand. At this stage this is the opinion of the analyst until such times that the concept is discussed with the actors, who are directly involved in the situation. After which relevant alterations can be made to any one of the stages.
7.4.1 Root definition of the colour forecasting process.

Colour forecasting can be viewed both as a service and as a process. The service is the marketing concept of the prediction packages produced by the specialist industry, the product of the colour forecasting process. The colour forecasting process is used to produce and promote a selection of colours for a predetermined season in the near future for all sectors of the fashion and textile industry. The industry uses the prediction packages as a source of information to assist in their own colour decisions for their products, in the hope that their resulting products will achieve optimum sales by meeting the desires, needs, preferences of the consumer. This would consequently produce a profit for the company.

The following two root definition variations are examples of later iterations before testing. As shown previously in figure 28, there are two basic viewpoints of the colour forecasting process under consideration; the positive and the negative. These are initially expressed at this stage as follows:

- **Colour forecasting is provided by a specialist service that makes available on a seasonal basis, information through a process of evaluation and analysis to accurately anticipate consumer colour preferences/demands for predetermined seasons in the near future for a fee. Presenting and delivering the information with a strong consensus to the fashion and textile industry to use as a tool to assist them in their own choices of colour ranges for their products that will be profitable for their company.**

- **Colour forecasting is a process to accurately anticipate consumer colour preferences/demands for predetermined seasons in the near future. In order for the fashion and textile industry to use as a tool to assist them in their own choices/selection of seasonal colour ranges for their product that will be profitable for their company.**

The above root definitions are holistic viewpoints that attempt to define colour forecasting. It is important for the root definition to be well defined and it must be tested. Testing may be a consistent critical assessment by the analyst to clear any ambiguities, constructive assumptions and clarified descriptions. The most commonly used test method applied to the root definition is that of CATWOE.
7.4.2 CATWOE

CATWOE is a mnemonic for: Customers, Actors, Transformation, Weltanschauung or World view, Owners, Environment. This test identifies any inadequacies in the root definition that can then be modified accordingly until a satisfactory root definition is achieved.

7.4.2.1 Customers or clients.

These are the customers or clients of the system i.e. those that benefit from the system or are affected by the output of the system. The output of the colour forecasting process is the seasonal colour story. The customers include those who use the system or receive some kind of benefit from the system. These are the personnel whose role incorporates colour range development and selection for their company’s products, i.e. designers and buyers of manufacturers and retailers.

Ideally, the consumer should be a beneficiary in terms of the availability of desirably coloured products on the high street. The level of benefit here is the real crux of the matter under consideration and determines the effectiveness of the process as a whole. The higher the level of benefit for the consumer, the higher the volume of sales on the high street (subject to income and state of the economy – dispensable income). The accuracy of anticipating the consumer’s colour preferences/demands determines the level of benefit the service is to the consumer and to the fashion and textile industry. Beneficiaries could also be viewed in the negative; the victims of the system, this may be considered more applicable terminology for both the fashion and textile industry and the consumer if the efficiency of the system is questionable.

7.4.2.2 Actors.

The actors were initially identified in section 7.2.1 and shown in figure 27, page 152. The actors carry out the activities of the system, or are instrumental in providing the benefit to the customers. The actors of the colour forecasting service are the employees that produce the colour stories for the colour forecasting company as they carry out the activities of the system i.e. the forecasters.
Those within the fashion and textile industry that actually carry out the colour selection process for their company are also actors of the system. They carry out their own version of colour forecasting using the information provided by the service as a source of inspiration.

The primary actors are the colour forecasters involved in the colour forecasting service, shown in level 1, figure 29, page 156. The secondary actors are the employees of the fashion and textile industry that undertake the role of colour forecaster within their company, shown in levels 2, 3 & 4, figure 29, page 156.

In the present system the consumer is not an actor, it is considered that they should be, as their input of colour preference data is considered to be an advantageous aspect that the system is currently lacking.

### 7.4.2.3 Transformation

Transformation and Weltanschauung / World view were considered by (Patching, 1990) to be the two most important elements of the CATWOE test, and recommended that the analyst may prefer to begin with these as they form the basis of the conceptual models developed at stage 4.

Transformation is the change that takes place within or because of (due to) the system, that is, the conversion of the input to the output and is expressed as a statement. As previously explained the output is the end product, the input are the components used in order to produce the end product. The components of the input as well as the precise definition of the output are a priority to working out the transformation.

It was recommended by Patching to first identify with the output, then the input. The output of the colour forecasting service is the colour story for a specified season. Its presentation format i.e. the prediction package could also be considered an output of the company as opposed to the process. This is essentially the hard tool or vehicle used to transport the delivery of the colour story to the company’s clientele. It is possible to have different levels of input and outputs. It may be beneficial at this stage to identify the output in the first instance as the colour story and secondly as the complete prediction package.
The input comprises the essential components of the system that are instrumental in the development and production of the output. The outside influences used to effect the development of the colour story. The actual developmental stages are the transformation, that is the conversion of the information derived from the different sources identified as input into the final colour story or prediction package, identified as the output. The transformation of the colour forecasting process is expressed as a statement below.

**Transformation statement** – A process of continually sourcing additional data either through a controlled or random manner in conjunction with thought, decision and reasoning processes that bring about the final colour story. This claims to anticipate colour preferences of the consumer for a given season in the near future.

![Transformation Diagram](image)

**Figure 31.** Transformation of the colour forecasting process.

Figure 31 is reminiscent of figure 15, page 131, section 6.5, shown again below in figure 32, demonstrating Newell & Simon's psychological theory for problem solving in three stages. Stage 1 of Newell & Simon's model, the initial state, is the same as the input of Checkland's model. Similarly, stage 2 of Newell & Simon's model, the operators, is the same as Checkland's transformation, and stage 3 of Newell & Simon's model, the end product or goal state is the same as Checkland's output. This is demonstrated in figure 32 below.

![Checkland's Model Diagram](image)

**Figure 32.** Checkland's transformation stage shown superimposed over Newell & Simon's three stage psychological theory model.

From the researcher's viewpoint, the output should accurately reflect the consumers' colour preferences as previously indicated in 7.3.2, where the level of likely benefit was discussed.
7.4.2.4 World view.

The weltanschauung or world view looks at the perception of the system from a particular viewpoint. Patching recommended using the various actors to establish their possible viewpoints based upon the research. At this stage this is still the analyst’s assumptions. Patching also pointed out that in reality, it depends upon a ‘person’s background, experience and particular interest in the situation.’ This is further developed when key actors are approached for their opinions and perceptions, this would be their personal viewpoint and not necessarily a shared or general one. It was also proposed that by

“explicitly considering the W, the analyst is validating the transformation specified in the root definition, i.e. by stating that this ‘image’ or these ‘assumptions’ make it reasonable to suppose that the transformation might be occurring.”

Page 77 (Patching, 1990)

The following viewpoint reflects the general opinions of the system obtained through the research from those using or having knowledge of the system taken primarily from chapter 3.

Colour forecasting is a service operating predominantly from the major fashion cities of the world. Those involved in the forecasting profession and in the fashion and textile industry appear to consider the service to be the backbone of this industry. The process of colour forecasting involves a seemingly accurate evaluation of the moods and buying behaviour of consumers, and a collection of colour data to be analysed and interpreted using a series of thought, reasoning and decision making processes in an intuitive manner. The process of colour forecasting is believed to delineate the possibilities and anticipate the direction of colour, and the rate of change seasonally and to understand the evaluation of the timing of such changes as acceptable by the consumer. The seasonal colour stories indicate hue, value and intensity and are heavily promoted throughout the industry. While seasonal colour stories are thought important to provide high street sales, they can also set limitations, dissuading individual companies to use their own intuition and feelings of colour direction/ change in conjunction with their own sales data. However, those with knowledge of the system are reluctant to divulge any in depth information, this may be due to secrecy or because these people, by way of human nature, are unable to explain the system they use in detail.
Discussions with various members of the general public revealed that there is little or no knowledge of the system's existence. Those realising that such a system must logically exist have no apparent knowledge of how it works. Key words of the worldview of the system could therefore be ignorance and misunderstanding.

7.4.2.5 Owners.

The owners of the system are those that cause it to exist or those that could cause it to cease existence. The actors can also be owners if they receive or benefit from the system. Ownership was defined by Patching as 'to whom the system is answerable, and without whom it would not exist.' On the basis of this statement it is debatable whether the actual colour forecasters can be expressed as owners. The format of the colour story information, i.e. the colour prediction packages would not exist as they do so today and the colour forecasting service would not exist. However, the activity of the colour forecasting process would continue within the fashion and textile industry just as it did so prior to the establishment of the forecasting profession as a separate entity, though each company may have a larger team than their predecessors had. The colour forecasters do benefit or receive payment from the system and therefore can be considered to be owners of the system as well as actors.

The information users within the fashion and textile industry as a whole are also owners of the system. Without the industry there would be no reason for the system to exist.

7.4.2.6 Environment.

The environment is referred to as the world that surrounds and influences the system, but has no control over it. In the first instance, the consumer can be considered to be instrumental in the formation of the seasonal colour stories, albeit covertly, as their preferences are claimed to be reflected and certainly the consumer has no direct or physical influence upon the system. Cultural aspects are also a consideration involving the consumer, particular colours are not acceptable by certain cultures as they are generally considered to be uncomplementary to their skin tones or have predetermined meaning imposed by their culture.
There are other external influences such as the buoyancy of the economy, the availability of raw materials, green issues, competition and fear by the industry of making costly mistakes.

7.4.3. Redefining the root definition

The purpose of colour forecasting, or the aim, is to provide an instrument that allows the designers and buyers of fashion and textile companies to avoid making costly mistakes when choosing seasonal colour ranges for their company's products. The aim of the process that the colour forecasting service provides is essentially:

1) the evaluation and analysis of the possible colour preferences of consumers for a season approximately two years ahead of the retail season giving ample time to fit into the production time plan of the industry, and
2) the presentation and sale of the information to the fashion and textile industry.

Colour forecasting is a worldwide service provided by an individual or individuals working for a specialist forecasting company that provides a limited colour story on a seasonal basis to the fashion and textile industry for a fee. The colour forecasting process and service produces and promotes a selection of colours for a predetermined time period in the near future for all sectors of the fashion and textile industry.

The forecasts indicate anticipated colours assumed acceptable to the consumer at a predetermined future season, through a complex intuitive and analytical process. The information is used by those responsible for colour decisions for their company's products. This source of information is used as a tool to assist in their own colour decisions for their products.

It is hoped that the resulting products will have a relatively high chance of meeting their consumers preferences, desires, and needs. This would be of benefit to both the company financially and the consumers in a climate of fluctuating economics, extensive competition and prolonged fear of business failure.
The CATWOE test was used to determine if the original root definition variations adequately encapsulated the full requirement of an ideal colour forecasting methodology. As a result of the test the root definition was modified to the following and formed the basis of the conceptual models produced in stage 4.

The collection, analysis and interpretation of colour and consumer preference data to produce a package / tool which can be used by the fashion and textile industry in the decision of colour choices for future product ranges.

7.5 Conceptual models. (Stage 4)

Patching realised that stages 3 and 4 of the SSM can overlap somewhat. Some analysts prefer to complete stage 3 prior to attempting stage 4, whereas others prefer to begin to develop the initial conceptual models while working through stage 3 as the transformation element is the basis of the conceptual modelling stage.

A conceptual model simply illustrates the relationship between the system activities graphically. The model(s) are based upon the root definition and usually expressed with verbs, but always using the minimum necessary activities for the system. It shows all the necessary components of the transformation of input to output as described in the root definition. Sub systems can be identified from the model. Each sub system can then become a system in its own right, this process is known as decomposing. Sub systems can then be developed individually, as it is recommended to keep the model simple by using only five to ten activities for each model. The activities are then to be expressed in terms of what is being done as opposed to how it is done. How an activity is achieved can be used within the root definition as a constraint of the system, such as how a particular activity will be controlled.

Patching defined the aim of the SSM as a learning curve, a tool to assist the analyst to better understand the problem area by clarifying it and assessing ideas that may or may not improve the system. It was not designed to be a solution to a problem specifically. The model is not to be considered right or wrong, simply a representation of how the system does or could be in reality.
Models can be presented in a number of ways preferable to the analyst. Two popular modes are flow charts and mind map structures. Flow charts show activities in a logical sequence where mind maps are less structured, examples of both are shown in figure 33 below.

![Flow chart and Mind map structure](image)

**Figure 33.** Examples of flow chart and mind map models

In accordance with the SSM at this stage, verbs were identified from the research related to the development of a colour story, and employing the methodology of colour forecasting within the process of the CATWOE test. Figure 34 below shows these verbs superimposed upon figure 31, page 161.

![Initial model using verbs](image)

**Figure 34.** Initial model using verbs.
The purpose of the industry buying the prediction packages is to ensure a high volume of sales directed by consumer satisfaction. To assure that the colour range is acceptable or better still, desirable to the consumer testing the market would logically give precedence over anticipating it. Figure 35 below shows the initial verbs as sub systems.

Figure 35. Sub systems using the verbs from the transformation stage.

From the initial model shown in figure 34 on the previous page, two further models were developed. The first is a representation of an ideal model for the colour forecasting process, incorporating the collection, analysis and testing stages of consumer colour preference data, shown overleaf in figure 36. The second model, figure 37 also shown overleaf, represents the current process.
Figure 36. Model of an ideal colour forecasting process.

Figure 37. Model of the colour forecasting process today.
7.6 Real world systems world comparison. (Stage 5)

In accordance with the SSM stage 5, figure 21, page 145 requires the two models to be tested and validated. This was achieved by sending out the two models along with a short questionnaire to those in the industry who use the current forecasting process. The current colour forecasting model was referred to as Diagram A. The proposed improved model, an ideal model, was referred to as Diagram B.

7.7 Survey results.

300 sets of models and questionnaires were sent with a covering letter to appropriate personnel within the manufacturing, retail and specialist sectors of the fashion & textile industry. The manufacture sector included fibre, yarn, fabric, knitwear and garment manufacturers and dyeing houses. 132 companies were targeted in this sector, 24.2% responded. The retail sector included multiple retailers and independent retailers. 133 companies were targeted in this sector, 46.6% of this sector responded. The specialist sector included colour forecasting companies and freelance design and colour consultants. 35 companies were targeted, 31.4% responded. This latter sector is smaller in comparison to the other two sectors surveyed. This is relative to the approximate proportion of these three sectors of the industry.

Of the 300 companies targeted only 111 were returned, 37%. This could be considered an average response from a postal survey, however, the problem of secrecy surrounding the colour forecasting process to maintain a monopoly in the field may have heavily contributed to this low response rate. 6 respondents (2 from the manufacturing sector and 4 from the retail sector) returned their questionnaires unanswered with a brief explanation of why. The reason generally being that they did not use the forecasting system. This statement was contradicted by some when stating a system they do use. There may have been other potential respondents who felt the same but just did not return the questionnaire, adding to the low response rate.

The following results exclude the 6 unanswered questionnaires, therefore based upon 105 responses, 94.6% of the total returned for analysis, or 35% of the total targeted. 59.5% of the responses returned came from the retail sector, 30.5% from the manufacturing sector and 10.5% from the specialist sector.
7.7.1. Question 1

Question 1 asked the respondent to give their opinion as to whether or not Diagram A, shown in figure 37, page 168, closely represented the current forecasting process. The respondent was invited to tick either the Yes or No boxes provided. 82.86% agreed that the model was a close representation of the current colour forecasting process. 17.14% disagreed.

7.7.2. Question 2

Question 2 gave respondents the opportunity to pass comment on Diagram A in order to identify any omissions to the model, or any other discrepancies between the model and the respondents own methodology. Only 24 respondents offered any comments here. As a high percentage of respondents had agreed in question 1 with the accuracy of the model, the low response here was not considered unjustified. However, less than half of those disagreeing with the accuracy of the model offered any explanation as to why they had disagreed.

The comments that were given indicated that some respondents do give some consideration to previous season's best sellers and are referring to this action as recognising consumer preferences. This appeared to be a misunderstanding of the model terminology. As previously stated, the general public can only buy what is available at that time. Sales data gives only a snap shot of purchases in the present or past, it does not give any guidance on preferences of colours not currently on offer.

Some respondents claimed to be actively consumer testing colours at present. However, from their descriptions of the process, it would appear that trials are conducted in-store to test its acceptability as opposed to actually asking the consumer at source. This concept was discussed by (Goworek, 2001) who stated that only large retailers are financially in a position to do this due to the quantity of stock required for testing and that the acceptability of the colours may be low due to under-exposure of the colour to the consumer. In-store testing is not testing colour preferences in terms of actually asking the general public to give feedback on colour choices.
One independent retail respondent explained that they did not use any form of forecasting due to lack of resources and inclination. No insight was given as to how colour choices are made for the stock and they did not realise that some kind of system is used, if only purely intuition. To state having no inclination is a rather naive viewpoint, meeting the demands of the consumer and customer satisfaction are paramount to a company’s survival. Other respondents who replied No to question 1 stated in question 2 that the diagram was not applicable to themselves as they do not conduct a colour forecasting process. To reiterate the point made above, some kind of decision making process has to be engaged in order to make intelligent choices on colour for stock, unless garments are selected totally at random, and no respondent admitted to using this methodology.

It was also highlighted by the manufacturing sector, particularly dye houses, that they work on a commission basis and therefore dye to their customer’s specifications. Some yarn merchants stated that they may buy stock without consideration of their customers needs, claiming that the yarns will sell eventually. The respondent’s logic is difficult to understand as money tied up in stock is dead money until that stock sells. However, it is realised that many of these yarn merchants are often driven by low price opportunities (stock clearance sales), to a higher extent than planned purchasing or stock purchasing. Would it not be better business sense to stock to demand? Also chances of repeat orders would be hindered when the yarn eventually sells some years later as it would be difficult to match the dye. This kind of business practice may also add weight to the low response rate as potential respondents may feel that they do not use a forecasting system and that their replies are of little consequence or value. Respondents returning unanswered questionnaires highlighted this in their reasoning for returning them unanswered.

Feedback offering constructive advice for amendment of the model was given by a small number of respondents. This information was used in stage 6 of the SSM and discussed later in section 7.8.

One particular comment of interest, was given by a respondent from the specialist sector, that ‘sometimes a whole season can be based on best-sellers — not a forecast’. While the range would not offer the consumer anything new, it would support the prime importance of colour preference data and its application to the colour story. Though again, present colour preference data will not highlight potential new colours for the range.
7.7.3. Question 3

Respondents were asked in question 3 to state their opinion of whether or not the current system could or should be improved to benefit both the fashion and textile industry and the consumer. Like question 1, this was simply a case of ticking either the Yes or the No box. 68.57% agreed that the current system could or should be improved, 22.86% disagreed, 5.71% did not answer and 2.86% indicated on the questionnaire that they did not know.

While a total of 8.57% were unsure, of the high response rate that were in agreement, 58.3% were from the retail sector, 29.2% from the manufacturing sector and 27.3% from the specialist sector. This would indicate that the retail sector is more conscious of consumer satisfaction than the other two sectors, because of the direct link they have with the consumer. Another possibility may be a shift in the responsibility for colour direction. This aspect will be expanded upon later in section 7.7.6.

7.7.4. Question 4

In question 4 respondents were asked to express their opinion on the ideal model referred to as Diagram B, shown in figure 36, page 168. They were asked to state their agreement as to its potential to be an improvement to the current forecasting process by ticking either the Yes or No boxes. 62.86% of respondents agreed that the ideal model was a good representation of a possible improvement to the current system. 34.29% disagreed and 2.86% were undecided.

Of the total respondents in agreement with the model 63.6% were from the retail sector, 22.7% from the manufacturing sector and 13.6% from the specialist sector. In proportion to the number of respondents in each of the three sectors, 67.7% of retailers agreed, 46.9% of manufacturers agreed and 81.8% of the specialist sector agreed. This would apparently indicate that those involved in the initial process would welcome a database of hard information that would assist them to develop their colour stories with stronger objective tools, and that the retailers too would appreciate this more tangible concept. The manufacturers may be dictated to more so than being directives in the present system as the responsibility of colour direction changes, as discussed later in section 7.7.6.
7.7.5. Question 5

Question 5 gave the respondent the opportunity to pass comment about the potential ideal model for suggestions of improvement. 65.71% of respondents offered some kind of comment, unfortunately much of this was considered irrelevant to the model itself. Evidently more respondents were willing to give criticism for a model that they were not currently using themselves than the current model.

Possibly the most common bone of contention was the concern of time scale for the additional sections. Particularly if after the testing stage, colours are rejected and the process has to begin again. It was suggested that the testing stage should appear earlier in the process. It was also suggested that the testing stage was not necessary as this respondent felt that some element of risk should be borne by the forecaster. This comment came from a respondent in the specialist sector. With due respect, as long as their colour prediction packages sell, this sector is at liberty to adopt this viewpoint, whereas manufacturers and retailers are without question requiring more secure predictions.

Another respondent suggested omitting testing consumer preferences as when dealing with the fashion world the consumer does not understand the process. The concept of the ideal model does not suggest any need for the consumer to understand the process of colour forecasting, they are simply asked to give a contribution to the data collection process by indicating their colour preferences. It would appear that this respondent had lost the concept of the importance of the consumer in the world of fashion. This would also indicate that a proportion of the industry still feels that they should be dictating to the consumer. Other respondents also indicated this attitude by stating that the consumer does not know what they want until they see it. This emphasises the importance of marketing to expose consumers to something new in readiness for its acceptance. In some respects this aspect can be utilised by the ideal model, as a series of colours could constantly be exposed to those consumers interacting with the market research tool. Concerns were also given to the additional cost of these stages.

There was a small concern that the methodology would not be forecasting if the consumers are given what they want. However, the colour palette to be tested has to be compiled or predicted initially, the testing stage is used to verify the colour palette.
One respondent commented that an element of surprise and beauty is always required of a range. Surely this element should be incorporated into the application colour and the style of the end products. It should be remembered that colour is an important influential factor of the consumer's buying behaviour, but other aspects are also influential and important. These other 'tangible elements' were discussed by (Goworek, 2001) and identified as; fabric handle, weight, texture, fit, trims, embellishments, quality, brand, sizing, price and washability. Warmth and comfort are also aspects that the consumer considers. It is the role of the designer and of the buyer to take these aspects into consideration. The garment as a whole should reflect something new, not the colour alone.

It was suggested that colours are cyclical, colours return after a few seasons and that this form of data is similar to that proposed by the ideal system. Also data collected from current sales offers the same sort of data for analysis. Chapter 3 discussed the use of historical data as a tool for colour forecasting, it was considered debatable whether this data is of benefit or not. A useful source of data or not, past and present trends do not give feedback of consumer acceptability of colours not available at that time. The proposed improved system would be used to collect, on a continual basis, data on colours not currently offered, as well as aiding assessment of the changing levels of acceptance of current colours offered in store.

Some concern was expressed regarding the research procedure in terms of who would collect and analyse the data and who would represent the sample. This is a very interesting point. It is envisaged that a specially designed system would be developed, which would be sited in stores for consumers to interact with. The analysis would be undertaken by designers and/ or buyers who are currently involved in using the colour forecasting process.

There was an encouragingly substantial amount of positive feedback which included suggestions that using colour preference data could save a great deal of time for the system user. Consumer opinions were recognised as beneficial to the retail industry and that including the consumer in the process would send out a positive message and make the consumer feel valued and respected. It was felt that consumer preference information would help to quell the influence of the buyer's preferences in ranges. Many respondents felt that the concept was of interest and could possibly supply the retail sector with suitably concise forecasts if achievable at speed.
A section was provided for additional comments that were invited by respondents who wished to add anything of importance. 36% of respondents took the opportunity to add further opinion, though little seemed to be of real consequence. Some respondents used the space to reiterate their assumed role as dictator to the consumer. Others were more concerned that a rigid colour palette may result and would be unchanged season to season. This is not considered to be the case, as each retailer would be working with data obtained by their own customers, or potential customers. The information would be unique to each store, therefore producing different ranges in different stores in accordance with their target market customer. This would result in more choice for the consumer, on the high street as a whole. Retailers with more than one outlet would benefit from the ability to regulate the different levels of colour acceptance in different store locations across the country, and across the world if they retail globally. Others felt the concept was worthy of testing.

One respondent felt it would be great to develop a method to get consumer preference data quickly and keep constant monitoring on changes of tastes. Another highlighted marketing as a provisional method of continually exposing the consumer to influence perceptions prior to going on the shelves on the high street to optimise sales. These points are incorporated into how it is envisaged for the new system to contribute to the present system.

7.7.6 A shift in the responsibility of colour direction.

Question 3 of the survey discussed previously in 7.7.3, indicated a high response in favour of the concept of improving the current colour forecasting system, with a high level of support from the retail sector. It was suggested in this section that this could be due to a possible shift in the responsibility for colour direction.

The responsibility for colour direction was discussed in section 7.3.1. Research to that point had implied that the onus of colour was with the primary market sector, following on the industrial revolution to present day. Figure 29, page 156 was developed to illustrate how colour forecasting information is used within the fashion and textile industry. Figure 30, page 157, illustrates the proposed missing link; consumer colour preference data. The latter figure suggests that consumer preference information could be taken from the consumer and used by the specialist service as a tool to assist in the compilation of more accurate predictions.
The survey highlighted that the retail sector, and in turn, the garment manufacturing sector are now beginning to dictate to the primary sector. This was shown by the comments given by dye house personnel and yarn merchants. They declared that they work primarily on a commission basis, producing to their customers’ requirements.

Retailers are becoming more aware of the consumers needs/ desires through the development of market segmentation through the use of target market profiles, that aims to assist the retailer to stock their stores in accordance with the requirements of their average customer. The target market customer profile is fictitious, but based upon market research, which includes demographical information and lifestyle analysis.

During a discussion with the head designer of a Leicester based fashion company, who wished to remain anonymous, it was demonstrated that the responsibility for colour direction is beginning to change due to the restructuring of the current system of manufacturing and retailing. This particular company produces garment designs and specifications around the table of their design room with buyers working for some of the top high street retail stores. The production of the garments are undertaken by local CMT (Cut, Make and Trim) factories. The fashion company then screen prints the surface design on to the garments in accordance with their clients requirements. The specifications, including the colour range, are agreed upon by both parties, though the initial colours are determined by the retail sector, the fashion company advises on any problems they may encounter with particular colours on certain fabrics/ fibres.

It would appear at this stage, that the system previously recognised has changed in some areas of the industry. The retailers are now becoming more aware of the consumer, observing and testing through in-store trials to better anticipate the consumers preferences, and subsequently dictating their requirements to the manufacturing sector, thus shifting the onus of colour direction.

Figure 38 shown overleaf is a variation of figure 30, page 157, showing the original system, in black, and the newly developing system, shown in red. If the developing system replaces the current/ past system entirely, the specialist forecasting industry would be in danger of ceasing to exist. The responsibility of colour would be entirely with the retailers. At present the two systems appear to be occurring simultaneously.
Figure 38. The original system and the newly forming system of the fashion and textile industry.

7.8. Revising the two models (Stage 6)

At this stage of the SSM the information obtained from the people surveyed in the real world scenario was collated and examined in order to make adequate changes to the models.

7.8.1. Diagram A - The current model.

Diagram A was the presentation of the current colour forecasting process shown previously in figure 37, page 168. Two retail respondents claimed to do in-store trials instead of anticipating consumer selection as previously stated. However, it is doubtful that all new styles and colours are subjected to this type of initial testing and it must be appreciated that an element of anticipation is required in the first instance to decide on the colour story / palette. It could be a consideration to include in-store trials within the anticipation of consumer acceptability, though it is considered more fitting to add this as a separate stage. As only 1.9% of the respondents appear to do this additional stage, and all from the retail sector, it is not considered to be a viable change to make to the initial model.
Three retail respondents and one respondent from the specialist sector, 3.8% of all respondents, include sales data as part of the collection of data. The model does not, nor is intended to specify the sources of information, these may vary from company to company, and from individual to individual. The intention of the model is to show the process not the sources of inspiration and data.

One respondent of the manufacturing sector questioned whether the analysis of the data should precede the process of interpretation of the information. This is a very valid point, and one that was considered to be incorrect at the developmental stages of the models. It was decided to leave the error deliberately to assess the acknowledgement of accuracy observed by the information users. Only one other respondent, from the specialist sector, picked up this error.

The question must be asked whether or not the users of the system are fully aware of the process they use. The definition of analysis as given by the Concise Oxford Dictionary (C.O.D) is the resolution of simpler elements; problem solving. To analyse is to examine minutely the constitution of. Whereas interpretation is to explain; understand; artistic representation. In hindsight it is considered appropriate and correct to alter the model even though only 1.9% of respondents recommended this change, on the basis of the true definitions of the verbs.

Only one respondent actually altered the initial model sent. This specialist sector respondent’s revised model represents that person’s methodology and is shown overleaf in figure 39. This includes the change of analysis and interpretation.

This respondent suggested no return from the development stage of the colour story back to further analysis and interpretation of the data. The process is to be carried through to the accept and reject stages where if the colour story is acceptable the respondent wishes to return to the data collection stage and follow through the process again. This is not considered necessary or correct. The forecaster should be free to engage in the analysis and interpretation until the colour story has been developed satisfactorily then refined for compilation and presentation. It may also be appropriate for the forecaster to continually collect data during the development stage again until a satisfactory stage is reached.
7.8.2. *Diagram B - An ideal model*

One respondent from the manufacturing sector commented that it would be a big jump back to the beginning if tests rejected colours, therefore testing would be better placed earlier in the process. A second respondent from this sector proposed to omit the testing stage completely and taking a little risk. One respondent from the specialist sector was in agreement with this concept, though the reasoning was somewhat opinionated in that the consumer does not know what they want or like without being told. This is typically the opinion of a dictator of the fashion world. However, if consumer preference details were collected on a continual basis to build up a database of information, then the testing stage could be omitted. The data should be more accurate, relatively than anything which the current system offers, as it was gathered from source. With more accurate information, theoretically the colour palette as a whole should not be subjected to rejection. Individual colours may be eliminated while developing the final colour palette.
It is therefore considered appropriate to exclude the accept and reject stages in favour of a stage of selection & elimination which would logically appear between the analysis and interpretation stages. One respondent queried the inclusion of new technology, again this would be a source of information obtained at the collection stage and is not a process in its own right.

7.8.3. The revised models.

Figure 40 below and figure 41 overleaf are the revised models developed from the feedback presented by the respondents of the survey.

Figure 40. The revised current model of the colour forecasting process.

On the revised current model, shown in figure 40 above, the order of interpretation and analysis processes have been changed around as the process of analysis should precede that of interpretation.
Alterations were made to the proposed ideal process model and shown in figure 41 below. The collection of data and observation was changed to initial and continual collection of data and observation. The market research of consumer colour preference information was changed to market research – continual collection of consumer colour preference information. The analysis and interpretation processes were reversed as per the current model above, with an additional section between them termed selection/elimination of colours. This eliminates the need for the acceptance and rejection, and also the testing stage.

![Diagram](image)

**Figure 41.** The revised proposed ideal model for colour forecasting.

In reality, it would be desirable to retest these revised models with the industry's personnel and further modify if necessary until the optimum results considered have been attained. This was not achievable within the time scale, though from the results of the survey, it was felt that the models have been adequately revised.
One further point to bring to bear here is the second deliberate error on the two models sent out to the industry. The output on Diagram A read in short, as a tool to provide consumer acceptable/desirable colours. Diagram B read, consumer desirable/acceptable colours. This was to propose that the output of the current system is primarily concerned with acceptability and the improved system is concerned with consumer desirability. This was not commented upon by any of the respondents.

7.9. Action to improve (Stage 7)

Stage 7 of the SSM; action to improve, would only be realised if the industry or sections of the industry adopted the suggested ideal model. Also, Checkland and subsequent writers on SSM make the point strongly that different investigations can use whichever stages of the methodology considered suitable and that it is not necessary to use the complete model.

7.10. Testing the missing link

The missing link was defined as consumer colour preference information as discussed in section 7.3.2. The survey which was conducted to validate the models with personnel within the industry suggested that a relatively high percentage was in favour of improving the current colour forecasting system and that the inclusion of consumer colour preference data would be advantageous, this was particularly felt by the retail sector.

It was considered a necessary stage of the research to test if consumer preferences are being met by the current system and to test the validity of using consumer colour preference information. This was achieved by asking consumers their opinions of the colour range currently on offer and identifying any colours they felt were missing, therefore testing the effectiveness of the current system. The market research exercise was conducted over a few weeks within a popular shopping centre on the outskirts of Leicester city centre. One hundred female respondents were invited to answer a short questionnaire comprising six questions. Females were targeted as they are considered likely to buy for their males and children as well as for themselves.
7.10.1 Question 1

In the first instance respondents were asked to identify the store they had visited. Stores available to the shopper at this particular shopping centre where fashion is available include New Look, Dorothy Perkins, Principles, GAP and Wallis supplying the low to mid mass market (price bracket). Variety chain stores; Marks & Spencer (M&S) and BhS. JJB Sports and the supermarket Asda.

7 of the respondents had visited more than one store. 19 had visited New Look, 8 Dorothy Perkins, 3 Principles, 3 GAP and 5 had visited Wallis. A total of 38 of the respondents had visited the low to mid mass market retailers. 20 respondents had visited M&S and 3 had visited BhS, making a total of 23 had visited the variety chain stores. 5 of the respondents visited JJB Sports and Asda 15.

12 respondents had not specified any particular store. This was possibly due to them being approached prior to their shopping experience for that day.

7.10.2 Question 2.

Secondly, respondents were asked to identify whether they were primarily shopping for women’s men’s or children’s wear.

80 respondents were shopping for women’s wear, 9 for men’s wear and 1 for children’s wear. 10 did not specify any particular sector. These respondents may have been window shopping or specifically shopping for non-fashion items on that occasion.

The low percentage shopping for children’s wear may have been due to the survey being conducted on school days. In general, unless shopping for very young children, Mothers tend to take their children with them when shopping for them.
Question 3.

Respondents were asked to state whether they had already made a fashion purchase on that day. 77 had made a purchase and 23 had not at that time.

Question 4.

Respondents that had made a purchase were asked if the colour had influenced their purchase. Those that had not already made a purchase at that time were asked to state, whether they thought that colour would influence their next fashion purchase.

83 said that colour would or had influenced their purchase. 17 claimed that colour had not, or would not have a bearing upon the purchase.

66 stated that colour had influenced the purchase they had made on that day. 11 stated that they had made a purchase but that colour had not influenced that purchase. 17 respondents had not made a purchase at that time but thought that colour would be an influential factor. 6 had not made a purchase at that time but did not feel that colour would influence them to make a purchase.

While no explanation at this stage was sought from respondents as to why they did or did not feel that colour was an important influence of a purchase, four respondents offered the following additional information.

One respondent had purchased and felt that colour was an important factor, but was also influenced by the suede fabric. Two respondents had both purchased and felt that colour did not influence the sale as the garments in question were denim items. The fourth respondent had made a purchase also, and did not feel swayed by colour as the style and the fabric was more influential. This respondent had purchased a white garment but commented that a red or black would have been preferable.
It would appear that colour is strongly influential when purchasing fashion garments and that sometimes the fabric, particularly specialist fabrics such as denim and suede will influence a purchase without too much consideration to the colour. Also at times, style and fabric will induce the consumer to purchase even though an alternative colour would have been preferred. It may be possible that staple colours or neutral colours such as white, black, cream, beige are more likely to be purchased as a compromise to the preferred colours than fashion colours would be. These staple colours are therefore considered by the industry as safe colours.

7.10.5 Question 5.

Respondents were asked if they were satisfied with the current colour range offered in the store they had visited by stating either Yes or No.

51 of the respondents were satisfied, 49 were not. (Perna, 1987) stated that the colour forecasters aimed for 80% accuracy in their predictions. The survey results here would support that this is not being achieved with the current system. Also that this system is not attaining a high percentage of satisfaction, therefore not effectively meeting consumer demand.

At this stage respondents were invited to give some feedback on why they felt dissatisfied with the current colour range on offer, 23 respondents gave feedback. 5 said the current colour range was dull, 3 stated that they desired more colour, as opposed to neutral colours, and 4 respondents felt there was too much black, white, beige. 6 felt there was too little choice, or too much of the same and 1 requested a better selection of colours. 2 requested for brighter colours to be available. 1 respondent thought the range was boring and another felt the colours were dated.

7.10.6 Question 6.

Finally, respondents were asked if they felt that there were any colours missing from the range currently on offer, by answering Yes or No to the question. 63 answered Yes, 36 No and 1 respondent was unsure.
Respondents who did feel that certain colours were missing were asked to specify the colours they would like to see in store this season. 21 requested brighter colours, 6 warmer colours, 5% more colour, 5 richer colours, 2 wanted to see something different and 1 respondent requested a better selection.

More specific colours were also identified by some of the respondents. These colours included Oranges by 7 respondents, Purples by 5, Turquoise by 5, Greens by 4, Reds by 4, Pinks by 3, Blues by 3, Yellows by 3, Mauves by 3, Terracotta by 2, and Russets by 2 respondents.

It must be pointed out here that specific shades, tints, and tones of colours were not asked for, therefore the feedback is of a more general nature. To extract more precise information from respondents it would have been necessary to show samples of colours to interpret the respondents' thoughts.

7.10.7 Summary of the market research exercise.

This section of market research substantiated that colour is a very important aspect that has a strong influence upon potential purchases of fashion items. Also that the level of satisfaction of the current colour range offered to the consumer is much lower than the forecasters aim for. It can therefore be assumed from this survey that the current colour forecasting system is not producing the desired results and would benefit from some kind of improvement.

7.11 Testing the validity of consumer research.

A further market research exercise was conducted to test the effectiveness of the proposed ideal model and to test the consumer acceptability of a colour palette produced by employing consumer colour preference information.
The market research was conducted in a market town on the outskirts of Leicester over two consecutive weeks. 100 respondents were invited to indicate their preferences on a selection of 20 colours. Each respondent was shown the same printed sheet to ensure colour consistency that may have varied from sheet to sheet had separate sheets being used for each. Each respondent was simply asked to state which colours they liked, the information was recorded by the analyst by ticking the preferred colours on separate record sheets.

The previous market research exercise discussed in section 7.10 suggested that the colours currently available to the consumer on the high street were preferred by approximately half of the respondents surveyed. The current colour range comprises the dominant colour story within the high street stores, as observed and noted at this time. The colours were not matched up in stores to any colour system, such as Pantone, as a large variety of one colour will always be offered due to differing dye lots, different fibres producing different colour variations from the same dye, and the manner in which colour is communicated by designers and buyers from the exhibitions attended back to the office, as previously discussed in chapter 3. A variety of additional colours may be available within the stores in smaller proportion. These colours could possibly be part of a trial range or most likely, previous unsold stocks.

Representations of the current colour range were selected from a previously compiled colour palette used for a similar survey in 1998. This previous survey was conducted in order to collect colour preference information using a palette of 50 colours. The colours included brights, shades, tints and tones of colours of the colour wheel with the addition of white, black, three different tones of grey and three different values of neutrals. Ten colours were selected from these 50 colours to represent colours of the current colour range, and shown overleaf in figure 42. The reason for this being that the acceptability of the colours used in this market research exercise could be compared to the results from the previous survey, thus evaluating the directional changes in colour preferences. Though there is a four year gap between the two surveys, the procedure could highlight how this type of colour preference system and data could be useful for colour forecasting.
Figure 42. The colours used in the survey to represent the current colour range.

Using the feedback from respondents from the market research discussed in section 7.10, ten colours were selected from the remaining 40 colour samples from the 1998 survey. Again this was deliberate in order to compare results. The selected colours are shown below in figure 43.

Figure 43. The colours used in the survey to represent the additional colours.

The colour palette comprising the current colour range and the additional colours requested by previous respondents was then compiled into a colour chart and shown to the respondents of the second market research exercise. The colours on the chart had been randomly arranged so that all the current colours and all the additional colours were not grouped together, or arranged alternately. The chart is shown below in figure 44.

Figure 44. The colour chart used for the market research.
7.11.3 Survey results.

The colour choice results for the individual colours are shown below in figure 45. The percentages represent the volume of respondents who chose those particular colours.

Current colours.

Figure 45. Colour choice results.

Figure 46 below shows a colour range using the ten most selected colours from the survey. This can be compared with the current colour range above. The top ten preferred colour range overall is a slightly warmer colour palette than the current colour range. This was felt to be desired by some of the respondents from the first market research exercise.

Figure 46. Top ten preferred colours from the survey.
Further statistical information is given below resulting from the analysis of the second survey.

1 respondent chose 20% of the colours on the chart representing the current colour palette. 5 selected 30% of the colours on the chart. 15 selected 40% of the colours. 27 selected 50% of the colours. 23 selected 60% of the colours. 17 selected 70% of the colours. 10 selected 80% of the colours and 2 selected 90% of the current colours represented on the chart.

4 of the respondents chose 20% of the colours on the chart representing the additional colour palette. 7 selected 30% of the colours on the chart. 15 selected 40% of the colours. 24 selected 50% of the colours. 20 selected 60% of the colours. 17 selected 70% of the colours. 10 selected 80% of the colours and 2 selected 90% of the additional colours represented on the chart.

The percentage of respondents choosing more of the additional colours than the current colours overall was 43%. The percentage of respondents selecting more of the current colours than the additional colours overall was 39%. 18% of the respondents chose the same percentage of current colours and additional colours overall.

1 of the respondents selected 30% of the colours on the whole colour chart. 3 selected 35% of the colours. 9 selected 40% of the colours. Another 9 selected 45% of the colours. 14 selected 50% of the colours. 17 selected 55% of the colours. 21 selected 60% of the colours. 12 selected 65% of the colours. 8 selected 70% of the colours. 3 selected 75% of the colours. 2 selected 80% of the colours and 1 selected 85% of all the colours on the chart.

Choices for the current colours ranged between 48% and 63%. The average was 56.7%.

Choices for the additional colours ranged between 49% and 63%. The average was 55.4%.

Choices for the top ten colour palette ranged between 55% and 63%. The average was 59.8%.
7.11.5 Comparison of survey results.

As previously stated, the 20 colours tested were taken from a previous survey in order to compare the two sets of results, to further understand and identify the direction of colour. The results of the two surveys are shown below in figure 47. The first percentage value printed on each colour represents the results of the 1998 survey. The second value represents the results of the current survey. The arrow beneath each colour shows the direction of the preference for that colour.

**Current colours.**

![Current colours chart]

**Additional colours.**

![Additional colours chart]

*Figure 47.* Comparisons of results, current survey and the 1998 survey, showing colour choice direction.

The range of choice values for the colour palette as a whole in 1998 was 40.6% to 75.3%. The average was 55.73%. The range of choices values for the current colours of today in the 1998 survey was between 47.3% and 75.3%. The average was 59.69%. The average percentage value was slightly higher than the average of the recent survey.
The range of choice values for the additional colours use for the colour chart was between 40.6% and 68.6% in the 1998 survey. The average was 58.03%. The average percentage value was again slightly higher than the average of the recent survey.

The range of choice values for the top ten colours of the recent survey, in the 1998 survey was between 40.6% and 68.6%. The average was 56.82%, as slightly lower than the average of the recent survey results.

Therefore on average, the current colours on the high street today were selected slightly less than they were in 1998. The additional colours on the colour chart shown to respondents were also on average selected slightly less today. But the top ten colours of the recent survey on average were currently selected slightly more now than they were in 1998. This demonstrates the effectiveness of using this type of data for forecasting. Obviously the database should and needs to be continually updated to regulate colour preferences more accurately than doing the exercise periodically.

7.11.6 Expofil Autumn/Winter 2003 colour trends.

To complete this section, the colour trends shown recently at Expofil for the coming season Autumn/Winter 03, were reported in Drapers Record (June 15th, 2002). 28 colours were shown in total, 8 of which were very similar to 8 of the colours tested in the market research exercise discussed in 7.11.1. It was felt of interest to include the results of these 8 colours from the current market research and from the 1998 survey. These 8 colours are shown in figure 48 below.

![Figure 48. Expofil 2003 trend colours used in the surveys with the results.](image-url)
Five of the colours are current colours, three are additional colours on the colour chart shown to respondents. Only three of the colours appear in the top ten preferred colours from the survey. Preference values for only three of the eight colours has increased from 1998 to present day. It would be of interest to see how many of these colours are actually accepted by the consumer when they are available, unfortunately this will not be during the time-scale of this research project to include the results.


Soft systems thinking has been used to investigate the colour forecasting industry and to provide two models. The first of these models expresses the methodology as currently used and the second expresses what the author considers to be an improved situation. These models were used to survey the UK fashion and textile industry in order to test their validity. The results of which were analysed and interpreted, and suggested that the models were easily understood by the respondents and that the response rate was good. The models were refined using feedback from the survey and consumer opinion was also tested through two market research exercises. The author felt that soft systems methodology has been shown to be an effective method for investigating and testing complex human activities within the fashion and textile industry.

Three surveys were conducted to validate the models developed by soft systems methodology. The first was constructive in the development of the final models of the current colour forecasting system and the proposed improved model. The two market research exercises gave information to support the low success rate performance of the current model in terms of consumer satisfaction and to validate the potential of the ideal model proposed as an improvement to the current system. The SSM proved to be an effective methodology to further understand the current system and to develop an ideal model.
8 & 9.

Conclusion

&

Recommendations.
Initially, the forecasters were identified as a specialist sector industry that had developed through the growth of the fashion and textile industry. Prior to the establishment of this sector, manufacturers used to gather inspiration from the haute couture industry. As haute couture became increasingly more impractical in its styling and design to separate itself from the ready to wear industry, their designs became less important as an inspirational source. The specialist sector established to relieve the manufacturers of this process that was becoming more complex and diverse in its sourcing for inspiration, due to the many lifestyle activities available to the consumer. While forecasting is primarily found to be the activity of the specialist sector, each manufacturing company and retailer of the fashion and textile industry executes some level of forecasting themselves. There are companies, particularly independent retailers that do not subscribe to a forecasting company and profess to work entirely intuitively. Even those in the industry that do subscribe to the forecast companies, use a method of forecasting not entirely dissimilar to that of the specialist sector forecasters. The forecast information is used as a source of inspiration, not as a prescription.

It was found that the current literature available on the subject of forecasting for the fashion and textile industry in general is limited both in quantity and in quality. Much of the literature was subjective, ambiguous and very much of individual opinionated viewpoints. There was found to be no evidence of any attempt to offer in depth analysis of the current process and certainly no previous modelling of the concept or investigations of its effectiveness on the high street, let alone suggestions for improvement.

It was found that much of the methodology used subjective tools such as intuition, inspiration and creativity. These aspects in general were considered to be little understood in themselves. Attempts were made to try to reveal their meanings and therefore better understand their application and implementation in the forecasting process. While the author supports the need for intuition, inspiration and creativity, it was considered that there is a need for more sophisticated journalism and serious academic study in this area.
The next stage of the research proposed to investigate further the methods employed by the forecaster and other methods that could be applied to the process. Each of the forecasting tools were broken down and discussed as separate aspects.

Various exercises were undertaken in the form of primary research. The first was an attempt to try to understand the current level of colour knowledge by forecasters or potential future forecasters. To assess the level of knowledge of those currently employing the colour forecasting process in industry may appear to be questioning their knowledge and ability and would be considered by them to be offensive. Therefore, it was decided to assess the level of knowledge of students who could in the future be responsible for colour forecasting for the company/ies they work for. The level of colour knowledge amongst these undergraduate and postgraduate students was surprisingly low. This may represent a serious problem for the future of fashion design in the UK, but it could also be perceived as an opportunity for colour studies to be re-introduced and strengthened in UK higher education.

The aim of this study was to investigate the process of colour forecasting to provide a better understanding of the methodologies in the development of colour ranges, and through systems models to attempt to develop a potential improvement to the current system. This was achieved through a systematic research programme to the requirements of the objectives set out at the onset of the project. The main objectives of the study were worked through in sequence. The first objective; to better understand the current forecasting process was approached holistically using secondary resources and primary exercises of investigation.

Chapter 2 was instrumental in the investigation of the second objective; to understand how, when and why the need for forecasting came about, and how it had evolved to its current state. It was found that as the fashion and textile industry had developed and increased in capacity, higher production speeds and quality of end products were easily achievable and provided a mass of ready to wear garments at affordable prices to all. Originally, fashionable garments were hand-made, bespoke, by skilled designers, tailors and seamstresses. The garments were expensive, as were the imported fabrics they were made from, which made fashion exclusive to the wealthy.

As the fashion and textile industry grew, garments produced for the mass population were no longer made on a one-to-one basis with the client. Manufacturers found it increasingly difficult to assess the needs of the consumer and to produce products they felt confident would sell.
The growth of the manufacturing industry served to increase competition between these companies. As the retail industry also increased in capacity, competition on the high street and the realisation that consumers have preferences and a diverse range of retail outlets now to choose from, retailers began to employ marketing techniques to tailor their stores to a particular type of clientele. As retailers began to recognise and understand their target market customer's needs and desires, so they began to dictate their stores' requirements to the manufacturers. While there are still many manufacturers that produce stocks to sell on to warehouses on the premise that they will sell, most manufacturers are now producing to order on the demands of the large retailers.

The need for forecasting was first evident circa 1825 when British manufacturers were known to visit the USA for inspiration. This need had increased by around the third decade of the twentieth century and very much intensified by the 1970's, as necessity for manufacturing became much more focused upon the needs of the consumer to ensure profitability. Colour is an easy aspect of a design to alter cost effectively, giving a fresh look to an otherwise dated style. This technique offers more mileage from one design, manufacturing specifications need little or no alteration, and the production workers are familiar with the making up techniques, reducing mistakes in making up and the time involved in learning new make up procedures which may slow down the production rate. This coupled with the fact that colour is very influential in the consumers' decision to make a purchase, colour and accurately forecasting colour preferences has become of major importance to the fashion and textile industry.

Once the need and importance of colour forecasting had been established and understood, the next objective was investigated. This was to establish who the forecasters were, the methodology used to develop colour ranges, and how this information was used by the industry. This was approached primarily through secondary research methods, by the evaluation of the current literature, as discussed in chapter 3. The methodology was looked at in depth through a series of primary research exercises, conducted using UK University degree students, and is discussed in chapters 4 and 6. This addresses the following two objectives; to investigate the methodologies hidden behind the mystique of the colour forecasting profession, and to investigate other methodologies that could be applied to the current process of colour forecasting. Included in chapter 4 was a synopsis of colour terminology and attempts to recognise the problems surrounding the communication of colour.
Chapter 6 used and evaluated various methodologies applied to the development of colour stories previously discussed in chapter 5. Individuals and teams of students were used in the various exercises to better understand thought and decision making processes adopted when developing a colour story, or range. Chapter 5 was also instrumental in the discussion and deeper understanding of the soft tools used by the forecasters, with particular emphasis upon intuition.

An investigation was also conducted to assess the methodology and its effectiveness of the teaching of trend forecasting to undergraduate students of a BA fashion degree and those of a BSc textile degree. Due to the lack of in depth information available to the student and lecturer, the teaching methods were found to be limited, leaving the student to develop their own methodology very much based upon a mix of naivety and intuition. After observing the methods used by these students a more controlled exercise was developed and executed using teams of postgraduate students, to attempt to evaluate the use of the think aloud method. It was originally thought that this method would be useful, but a number of problems were discovered upon its application to the exercise. It was evident that the methodology had to be better explained before students undertake exercises in this area.

Finally soft systems methodology was used to further investigate the colour forecasting process holistically, discussed in chapter 7. This addressed the final three objectives of the project, to develop, test and validate models and to develop an understanding of consumer preference information, and its benefit to the current system. Soft systems methodology proved very useful for the development of the conceptual models, one of the current colour forecasting system used and one of a proposed improved system taking into account consumer desired, or preference colour data. Both models were then refined to their present state, using information obtained from personnel within the fashion and textile industry, who responded to the questionnaires sent to them. It was found that a high percentage of the respondents of the research agreed that the current system was an accurate representation of the current system. Also that the industry as a whole would benefit from improvement to the current system, and that the inclusion of consumer, colour desired data would be advantageous.

To tie the loop, two consumer market research exercises were conducted to assess the benefit of collecting and using this type of information and to try to establish whether or not the current system is sufficiently providing garments on the high street, in colours that meet consumer demand/ desire.
It was found that the current system was not satisfying the consumer to the degree that the forecasters profess, and that the use of consumer colour preference data would be a beneficial tool for future forecasting. Though it was appreciated that it could be even more beneficial to specify to the consumer what particular item of clothing the proposed colours would appertain to, as certain colours may be considered acceptable for perhaps a blouse, but not for a trouser suit.

The most important points considered to have been identified by this research are:

- The driving force of fashion has always primarily been concerned with the consumer, though the nature of the consumer has changed throughout time.

- Colour is an important driving force of fashion today from both the viewpoint of the manufacturer, due to cost effectiveness and of consumer colour preferences.

- There is a strong need for more in depth knowledge and understanding of the colour forecasting process for students and the new comer to the fashion and textile industry, and consequently more effective teaching methods of the process.

- Soft systems methodology was found to be very successful in the investigation of the colour forecasting process, and for the development of conceptual models.

- Testing the models was instrumental for the validation and the refinement of the models.

It is considered that this research has added to the current body of knowledge in the understanding of the colour forecasting process and the assessment of the benefits of including consumer colour preference, or desire data into the current system.

Whilst the aims and objectives of the work have been to demystify and clarify the process, there was no intention on the part of the author to deny the part of intuition and inspiration which can be optimised by the addition of an effective process.
As with many research projects a series of aspects materialise along the pathway of investigation that warrant further exploration as separate subject areas as opposed to being part of the initial study that would result in deviations from the original project. It is therefore proposed that the following could be avenues for further consideration and investigation.

- The refined models developed in chapter 7 should now be tested in the industry, as were the initial attempts of the models.

- A different approach to this same study could be initiated by using other research methods, other than soft systems methodology, to compare with the findings of this study.

- The teaching of the colour forecasting process in fashion and textile related degrees could be greatly improved. This project could easily provide a platform for further investigation of the current teaching process and potential improvements.

- The perception and assessment of colour on an individual basis could be investigated, along with systems of the current communication methods of colour and suggested improvements to that particular system.

- Soft systems methodology could be applied to other aspects of the forecasting industry such as style.

- From a fashion historian's viewpoint, this study could be used as a platform for a more in depth study focusing upon the driving forces of fashion.

- Soft systems methodology or other research methods could be applied more specifically to the design and use of mood boards, or inspiration boards.
10.

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