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## Indian Organised Apparel Retail Sector and DSS (Decision Support Systems)

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### Abstract

*Indian apparel retail sector poses interesting challenges to a manager as it is evolving and closely linked to fashions. Appealing mainly to youth, the sector has typical information requirements to manage its operations. DSS (Decision Support Systems) provide timely and accurate information & it can be viewed as an integrated entity providing management with the tools and information to assist their decision making. The study exploratory in nature, adopts a case study approach to understand practices of organized retailers in apparel sector regarding applications of various DSS tools. Conceptual overview of DSS is undertaken by reviewing the literature. The study describes practices and usage of DSS in operational decisions in apparel sector and managerial issues in design and implementation of DSS.*

*A multi brand local chain and multi brand national chain of apparel was chosen for the study. Varied tools were found to be used by them. It was also found that for sales forecasting and visual merchandising decisions, prior experience rather than any DSS tool was used. The benefits realized were; “help as diagnostic tool”, “accuracy of records and in billing”, “smooth operations”. The implementation issues highlighted by the store managers were; more initial teething problems rather than resistance on the part of employees of the store, need for investment of time & money in training, due to rapid technological advancements, time to time updation in DSS tools is required . Majority of operational decisions like inventory management, CRM, campaign management were handled by ERP (Enterprise Resource Planning) or POS (Point of Sale). Prioritization as well as quantification of benefits was not attempted. The issues of coordination, integration with other systems in case of ERP usage, training were highlighted. Future outlook of DSS seems bright as apparel retailers are keen to invest in technology.*

## Indian Organised Apparel Retail Sector and DSS (Decision Support Systems)

### Introduction

In India, organised retailing, is contributing 3% of total retail sector and is still evolving. However, it is expected to increase to 5%, by 2010. Retail sector forms 10-11% of GDP<sup>1</sup>. It is alluring in terms of investment, employment opportunity, and usage of technology.

Retailing is in a rapid state of change due to speedy technological developments, changing competitive positions, varying consumer behaviour as well as their expectations and liberalized regulatory environment. In such a scenario, information is crucial to plan and control profitable retail businesses and it can be an important source of competitive advantage so long as it is affordable and readily available. DSS (Decision Support System) which provide timely and accurate information can be viewed as an integrated entity providing management with the tools and information to assist their decision making. There is a constant need to capture accurate information and make it available not only within the store but send it to warehouse, distributors and manufacturers.

### Retailing in India

Indian organised retail industry was to the tune of Rs. 13,000 crore for the year 2000. Organised retail industry was expected to grow by 30 per cent in the next five years and was expected to touch Rs. 45,000 crore in 2005, by 2010. Indian retailing is clearly at a tipping point. India is currently the ninth largest retail market in the world.

Modern advancements in ITES (Information Technology Enabled Services) and communication has permitted deployment of DSS (Decision Support Systems). DSS can be defined as computer based systems that help decision makers to confront ill structured problems through direct interaction with data and analysis models.<sup>2</sup> DSS are basically characterized by three capabilities; dialogues, data and modeling- the emphasis of each varies from organisation to organisation. DSS includes a wide variety of systems, tools and technology that support decision making. EIS (electronic information system), ESS

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<sup>1</sup> Retail Management-An Asian Perspective Draft Monograph,2006

<sup>2</sup> John R Beaumont, "An Overview of Decision Support System for Retail Management", Journal of Retailing Vol 64 No 4 Winter 1988 pp361-373

(Electronic support system), VMI (vendor managed Inventory)[1], GIS (geographic information system), OLAP (online analytical processing), software agents, knowledge discovery system and group DSS – all can be considered as DSS. Broadly two major categories of DSS namely enterprise wide DSS and desktop DSS exist. Enterprise wide DSS are linked to large data warehouses and serve several decision makers in a company whereas desktop single user DSS are small systems residing on individual manager's personal computer. Thus it is an interactive computerized system that gathers and presents data from a wide range of sources, typically for business purposes.

In west, many organisations have deployed ERP as the foundation of their IT Set Up, organised retailers are exploring CRM (customer relationship Management), BI (Business Intelligence), RFID (Radio Frequency Identification Deployment).<sup>3</sup>

Each sector with unique characteristics poses very different challenges to an organisation; hence in-depth understanding of one sector would provide deeper insight into the requirement of DSS to enable managers in that sector to take effective decisions. The proposed study, exploratory in nature aims at understanding DSS, its application in Apparel sector and issues arising out of implementation of DSS in Indian apparel retail sector.

### **Objectives**

The study focuses on store level DSS Tools for apparel category. The study being exploratory in nature plans to adopt a case study approach to understand practices of retailers in apparel sector with respect to deployment of various DSS tools. An in-depth study would enable to gauge their needs in terms of DSS tools, to understand the problems arising out of using DSS and future outlook. Hence, the objectives of the research study are:

- 1) To provide a conceptual overview of DSS, possible applications in organized retail formats in Apparel Sector,
- 2) To understand practices and usage of DSS in apparel sector
- 3) To discuss issues arising out of applications of DSS, benefits realized and future outlook.

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<sup>3</sup> Megha Budhani "An IT edge for retail" express computer online Vol 17 No 40 Dec 4,2006

## Methodology

In order to address the aforesaid objectives, we first review available current literature on DSS in organized retail. This will help us in understanding;

1. What is DSS?
2. How it can be applied in organized retailing?
3. How DSS is applied in developed western world?
4. What varied tools are being deployed in western world in apparel sector?
5. What issues arise in planning and implementing DSS as reported in literature?
6. What are the characteristics of organized apparel retail sector which throw challenges to a retailer?

On the basis of the literature review, conceptual understanding about DSS was attempted. Practices in Indian context were studied by looking at DSS applications in organized apparel retail sector. Following convenience purposive sampling, three players in apparel sector in Ahmedabad namely Jade Blue (multi brand men's apparel chain), Pantaloon and Raymond (a franchisee) were approached for case study. Store managers in charge of these retail outlets were interviewed to understand possible use of DSS in their store for operational decisions viz. visual merchandising, trend forecasting, supply chain management, CRM (Customer relationship management), category/ assortment management, promotion management. An in-depth interview guide (lead questions) was used for personal interviews with store managers.

## Literature review

Scanning the relevant literature on DSS applications in organized retailing; brief overview is presented in the following section.

Gallegos, Frederick (1999)[2] describes applicability of DSS in a wide variety of applications of semi-structured and unstructured problems confronting managers and offers categorization of DSS into model-oriented and database oriented DSS. Decision support systems allow people at many levels to systematically analyze problems before making a decision. In the process, these systems extend the range and capability of the decision-making process, increasing its effectiveness.

Eom, S B, Lee, S M, Kim, E B, Somarajan, C(1998)[3] report 271 published applications of DSS in organizations in a survey of DSS applications between period 1988-1994. It was found that there appears to be more creative applications of optimization and suggestion models and a decrease of representation models. Moreover, group decision support systems, executive support systems, and knowledge-based systems applications are becoming more prevalent in many organizations. Three non-MS/OR tools : viz graphics, artificial intelligence, and visual interactive modeling; are emerging as powerful DSS tools.

In their subsequent study- an extension of previous study for the period 1995-2001, they identified two hundred ten published applications. To examine the development pattern of a specific DSS over time, they proposed a framework to classify the articles/applications into various categories according to: (1) the area of application; (2) the year of publication in each area of application; (3) the distribution of underlying tools in DSS; (4) a classification based on Alter's taxonomy; and (5) the management level (operational, tactical, or strategic) for which the DSS was designed.

The role of model-based decision making is gaining increasing acceptance as organisations try to gain a competitive advantage. The progress in information systems development has led to a natural coupling between the data modeling, symbolic modeling and “What-if” analysis phases of a decision support system (DSS).

DSS tools help companies automate an enterprise-wide assessment of cause and effect. The software monitors "soft" factors, which indicate whether a certain strategy has been successful, as opposed to operational measures. This tool can help in creating a culture of management based common views and goals.

Little (1989)[4] suggest that DSS must be simple, robust, easy to control, adaptive, as complete as possible and easy to communicate with.

Barnes, Liz; Lea-Greenwood, Gaynor (2006) [5]stated that the phenomenon of fast fashion in apparel sector is under-researched academically, yet has received attention in most of the fashion and business press .The concept of agile supply chains or supply chain theory is explored using in-depth interviews of key informants in the fashion

industry with reference to fast fashion requirements. The major findings of this exploratory research demonstrated a developmental process occurring in supply chain management in fast fashion industry. This research provided additional complexity on the existing model of supply chain management for the fashion industry. There are implications for theoretical perspectives of supply chain management as well as retail operations.

Doyle, Stephen A.; Moore, Christopher M.; Morgan, Louise (2006) [6] explored the issue of supplier management within the context of fast-moving fashion retailing. The research suggested that retailers may adopt a multi-tiered approach, whereby dynamism and responsiveness are achieved through only partially agile supply chains.

The paper provided useful insights into the mechanism by which retailers may balance the need for customer responsiveness with the need for operational and financial viability.

Sheridan, Mandy; Moore, Christopher; Nobbs, Karinna (2006) [7], reviewed the potential contributions of category management (CM) to the UK fashion sector and subsequently to establish evaluation criteria for the application of CM in the UK fashion sector. Through qualitative research, with an exploratory case study method, they found that CM had limited application in the fashion industry. Fashion companies adopted collaborative structures in order to implement a CM approach and a CM approach contributed to the development of a fast fashion business orientation. The paper proposed a model of the evaluation of the application of category management in the fashion sector.

Tyler, David; Heeley, Jo; Bhamra, Tracy, (2006) [8], focused on the textiles and fashion clothing supply chain with the objective of identifying factors that constrain company activities and inhibit competitiveness. Through multiple case studies involving UK companies, significant blocks affecting dynamic performance of the participating companies were identified. They were: timing of fabric trade shows, lack of control of availability of fabric, forecasting, late stage product changes, geographical proximity to market, decision making decoupled from fashion trends, stock-outs and slow selling products. The paper drew conclusions about the strategic directions of fashion supply chains and suggested the need to develop strong personal and organisational relationships in order to produce a culture characterised by common goals, trust and mutual interest.

Bruce, Margaret; Daly, Lucy, [9], provided insights into the complex nature of fast fashion buying through case studies with a supermarket, department store and own brand label. The phenomenon of fast fashion raises questions about traditional approaches to sourcing and buying. The buying practices for fast fashion, namely, a combination of global and local suppliers were revealed. It was found that trust was an important factor in the supplier-retailer relationship to ensure fast delivery at an agreed quality. It was highlighted that integration of key internal activities and processes to facilitate the speed of buying decisions were necessary.

### **Findings**

Search on secondary sources of suppliers of IT tools for retail sector applications revealed many interesting developments of various DSS tools. Zebra Technologies [10], High Wycombe, UK based, has developed innovative printing solutions for business improvement and security applications. The applications include thermal bar code, "smart" label, receipt-card printers, etc. Printers with RFID printer/encoders and wireless mobile solutions are offered. It also offers software, connectivity solutions, and printing supplies. Its bar-code label printers are now plug-and-play compatible with SAP's business optimisation solutions. With no need for middleware or integration programming, the capability reduces implementation times and significantly cuts down the cost of printer rollout. Zebra has been a member of the SAP Software Partner Program since 1999, and the two companies have worked on bar-code integration for the last few years. The new developments create an easy way for users to generate bar codes on demand for asset tracking, compliance labeling, document tracking, and other business productivity improvements.

The Cisco network developed by Cisco, supports advanced data, voice, video, and mobile capabilities – allowing stores to manage their entire business, from supply chain to customer support, using information provided in real time, at the right time. The Cisco voice-over-IP technology allows a typical store to reduce its telecommunications consumption to just a few voice lines and a broadband connection, producing cost savings that essentially pay for broadband services. The Cisco retail solutions are made up of four modules: 1) Store Connectivity – Increases operating efficiency across stores using wide-area networks (WANs) and virtual private networks (VPNs) to access corporate and store information, including radio-frequency identification (RFID)-based inventory



management and standard retail applications. 2) Store Mobility – Uses wireless technologies at the point of sale (POS) for faster checkout and real-time product information, in the store to improve operations, and throughout the supply chain to reduce costs.3) IP Communications – Reduces retail costs through converging data and voice systems, providing instant communication throughout stores and with enterprise applications and resources, 4) The Store as a Medium – Supports employee training and productivity and maximises customer satisfaction with in-store broadcasting, multi-channel shopping, and digital signage, as well as revenue-boosting smart technologies and information kiosks.

Visual merchandising (VM) [11] is an important function and lot of tools in west have been developed in west. It is the way merchandise is displayed, SKUs (stock keeping units) are stacked, use of colours and sequence blocks, lighting, windows, mannequins. It makes shopping easier for customers and helps in portraying an unprecedented image of a retailer. The new tools of VM apart from colour, lighting, texture, mannequins and other traditional aids to engender the much-used 'wow effect' are; i) Digital Signages & High Definition Screens, ii) Mobile Technology (SMS/ Bluetooth): Nokia came out with its coolzone technology in 2005, allowing retailers to put a base station in the store and bring specific content to consumer with Bluetooth-enabled phones. With coolzone, retailers like music stores, phone shops and cinemas can offer promotional or paid content to the customers iii) Touch Screens, iv) RFID Technology v) Holography “Magic of diaphanous” vi) Moving Mannequins vii) IC Colour - using a software programme to control intelligent lighting fixtures, IC colour captures the aesthetic energy of a video source and translates it into a colour theme that saturates the surrounding area, enhancing the content and sensory stimulation, viii) Scent Technology,- Proctor & Gamble, Unilever, Kraft, MARS, Hershey's, and General Mills are testing this new, patented technology for use at POP (point-of-purchase) in retail stores to spread the aroma of a product without having to open the package. ix) Interactive POS, and x) Robots: Chatbot, a new avatar of robotics can interact with people and give response to the shopper's queries. Japan's Aeon has emerged as the pioneer retailer to introduce a robot in its stores. Through the display robot is also able to explain new products while guiding customers to various sections of the store.

## Characteristics of apparel retail sector

As apparel retail is **led by fashion**, a player needs to keep a close watch on fashion amongst teenagers as they are the trend setters. Role of Bollywood in **spreading fashion** needs to be understood. **Seasonal variations** on stocking pattern and need to clear inventory at the end of season should be understood by apparel retailer. Typically once an item is sold from the outlet, retailer ensures that there is **no repetition** of same. It gets replaced by different design, style, colour. Importance of **store layout**, décor is very critical. A browser visiting the store frequently likes to see changes in the layout otherwise he may carry the impression that stocks are not moving out of the store. Category management becomes very crucial function as transformation of design into production and delivery before the fad/ fashion changes occur in the market.

Zara - fashion [12] brand from Spain has been the first retail chain to adopt a “just in time” strategy. Instead of typical nine months for fashion brand to go from design to delivery, Zara short-circuits the process to fifteen days or less. This has resulted in no overstock policy and reducing the need for the frequent & massive sale. Production is in small batches and if item is not sold production is halted- each week 35% of the merchandise in a typical store is changed-revolutionary concept has created favorable publicity & loyal customers-on average, Zara customer visits a Zara shop 17 times a year versus 3.5 times for other fashion chains.

Interviews with operational managers of three retail apparel stores revealed interesting insights. The findings are presented below:

Case study on Raymond: With a 28 million-meter capacity in wool & wool-blended fabrics, Raymond commands an over 60% market share in worsted suiting in India and ranks amongst the first three fully integrated manufacturers of worsted suiting in the world. It is perhaps the only company in the world to have a diverse product range of nearly 20,000 design and colours of suiting fabric to suit every age, occasion and style. The company exports to over 50 countries, including USA, Canada, Europe, Japan and the Middle East. India's most prestigious brands are - Manzoni, Park Avenue, ColorPlus, Parx, Be: and Zapp. The Raymond Retail Shops are premium franchise stores offering men complete wardrobe solutions including men's accessories. There are over 300 stores exclusive 'The Raymond Shop' (TRS) in India with 27 outlets overseas in the Middle

East, Sri Lanka and Bangladesh. Domestic distribution is spread far and wide with more than 30,000 outlets that stock and sell our wide range of fabrics. [13]

The Raymond franchisee, a sole selling agent & franchisee since 80's is the second largest in Gujarat. The store is located in a posh area of Ahmedabad, known as "Manchester of India" because of the textile mills during British rule, with 3.5 million populations. The store stocks 4 brands namely- Manzony, parx, park avenue and color plus. It employs 35 people who are very loyal and have been working since the store opened in 1980s. With family ownership, the store is acting as a sole selling agent for other Raymond stores in Ahmedabad and as a franchisee with a floor area of 4500sq. ft. The company had specified its franchisees to adopt POS-(point of sale) software on a Virtual Basic platform. All operational decisions like stock reports, sale report, billing, inventory CRM, database and loyalty card programme are taken using POS supplied by Tally. The company recommended it, identified the supplier, undertook the training of store personnel and helped resolve initial teething problems. The company sanctions the budget for promotion and as per company guidelines the budget is spent. The company provided a week's training to managers & top key persons of the store when POS was implemented. Later on everyone was provided training. After the initial teething problems, POS has been in operation for more than 5 years now and the management of the store is extremely satisfied with it. Because of integration, all operational decisions are taken using POS. Raymond has not yet adopted ERP so the store manager does not foresee adoption of ERP in short term. The benefits realized are- chances of error reduced to a very great extent due to integration, ease in accurate ordering as POS helps in forecasting also, higher morale of the employees as many manual operations are redundant, quick turnaround as scanner feeds in the transaction and data base is updated in real time, results in less waiting time for billing with the use of scanner and error free billing as no manual inputs required. The company has planned loyalty card programme which entitles a customer to honour the card anywhere in India and the store does not have to maintain any separate records. That database is centralized and the respective store downloads from the central database. Benefits of POS as indicated were; no unnecessary paperwork, saving of time, accuracy, quick decision making and time saving. Since the franchisee stocks four brands of Raymond & its subsidiaries, it has to liaise with four vendors and since all follow a same system, back end operations of ordering, processing etc. are quite smooth and do not face problems of system integration. The

visual merchandising function is independent of POS and every fifteen days the store management changes the layout. Store also celebrates each local festival like holi, diwali, uttarayan and runs special promotions over and above loyalty card programme initiated by the Raymond company.

**Jade Blue: (Multibrand Men's apparel local chain)** The store started operations in 1995 with the floor area of 13,000sq. feet. The turnover in 2006 had been Rs. 22.5 crores. The average footfall per month has been 15000 and average billing amount of Rs. 3792. About fifteen brands like Arrow, Black berrys, Colorplus, Levis, Green Fibre etc are stocked. Private label brand contributes to about 25% of the turnover.

For operational decisions the store has implemented local customised ERP package whose implementation took almost one year. Essentially inventory management, ordering and managing logistics, promotions, addition of SKU, sales person's performance evaluation are based using ERP DSS system. Forecasting and campaign management is done with the help of judgment and prior experience of the owners. The ERP package has been found very useful in generating diagnostic reports and achieving coordination across chain of stores located in different cities. Breakdown due to power problem is the only problem that the store faces and since all the modules of the package are customised and implemented simultaneously, the store did not face any system integration or coordination problems. The store invested in training their billing section and IT person in charge looks after its smooth operations. Benefits such as efficiency in operations, superior coordination, enhanced profitability due to improved logistics, help in creating and sustain better and profitable relationships with customers, reduction in stock outs etc. are realised.

**Pantaloon:** A national chain, a multi brand apparel retail outlet – a departmental store is located in the posh area of Ahmedabad in the midst of other retail stores like Westside . It has been using ERP to manage its operations. The various brands like Leewise, Lee, private label like are stocked. Private label brands contribute about 30% to the total turnover of the store.

For operational decisions listed below, decision support system used are depicted in the table given below.

Functional area	Sales forecasting	Category Management	Visual Merchandizing	Security check
Type of DSS used	SAP (started using 6 months back)	SAP		NA
IT /SW Tools	REM (Retail Enterprise Management)		CORAL DRAW PAGE MAKER AUTO CAD MS OFFICE	NA
Time taken to implement DSS	6 months		NA	NA

The problems faced during implementation and use are:

- System integration problems: First 6 months SAP was not up to the mark.
- Manpower problems - Training of employees, Cataloging, Human mistakes

The benefits realised in using DSS in the operations:

- Efficient operations/ impact on business processes both internal and external-
- Superior coordination
- Higher profits/greater profitability: NA
- Diagnostic help in identifying problem areas
- High morale of employees
- Helps create and sustain better and profitable relationships with customers

Domestic retail giants such as Shoppers' Stop, Pantaloons, Big Bazaar [14] have been early adopters of cutting-edge networking technologies. Other prominent players like Lifestyle, Westside, Globus, Ebony Retail have also made extensive use of technology in the store operations. Wills Lifestyle, the exclusive lifestyle retail chain which is corporate major ITC's exclusive fashion retail chain has recently implemented the Intenia solution and Predator (Proactive Demand Accelerator) integrated retail solution, which is being used in the manufacturing unit of ITC Lifestyle Retailing Business Division (LRBD) and also its chain of specialty stores spread across 38 locations. The integrated solution will help the company streamline its operations in the areas of retail, manufacturing, finance and accounting management, customer order processing, distribution, and supply chain management. It has helped the retailer to effectively

manage its back-end by providing stock visibility across the supply chain from 'vendor' to 'shelf,' and to optimise inventory levels for savings on interest costs and improved return on investment (ROI), besides other benefits. As a result, there has been improvement in service levels at retail stores and overall increased efficiencies in manufacturing and distribution operations. The solution is built on 100 per cent Java technology and provides a future-proof platform with high scalability, independence and interoperability with other extension solutions.

In India, one of the major technological developments in recent year, that is impacting retail in a big way, has been the fast-paced transition from physical, paper-based exchange of value to a virtual electronic payment mode. Both Electronic Clearing System (ECS) and Electronic Funds Transfer (EFT) have grown rapidly over the past six years[15]. ECS volumes have picked up from a base of Rs.67.4 crore (USD 15.67 million) in 1999 to Rs.9,676 crore (USD 2.25 billion) in 2004. EFT too has grown from Rs.0.6 crore to Rs.15,711 crore over the same period. On the usage of payment cards, the NCAER-Visa study notes that the barely two-decade-old system has grown from 3 million credit cards in 1998 to an estimated 44 million plus credit and debit cards in 2004, giving a CAGR figure of 55 per cent. Debit and credit card transaction volumes also increased from USD 1 billion in 1998 to USD 23 billion in 2004. However, the usage is mostly confined to ATM cash withdrawals (80 per cent) and the transition to bill payment and shopping has just started picking up.

Companies such as Madura Garment are doing RFID implementation for back end operations currently, and not at the front end. As the technology is getting advanced and costs coming down, the future outlook is quite bright.

Some of the apparel retailers have started tracking consumer purchases through CRM and co-branded cards, some lifestyle retailers are doing so through their “affinity clubs” and “reward clubs” [16].

### **Future outlook of DSS**

Future outlook seems quite bright with the greater use of sophisticated tools like RFID, ERP or Collaborative planning and forecasting (CPFR) tools as adopted by western counterparts. Many national and international apparel chains are likely to use all the

modules of ERP package. It is envisaged that there will be a growing use of data warehousing and Data mining for diagnostics. Retailers are likely to invest in deployment of Wifi environment in retail outlets to reduce waiting time in queues, CRM applications and DSS tools for visual merchandising ,pricing and campaign management in an integrated or stand alone basis. According to a report by Datamonitor (2006), global apparel, accessories & luxuries market is likely to grow by 4.5% annually and Asia Pacific region is anticipated to acquire leadership position by 2011. These statistics definitely pose promising future for apparel industry of India.

### **Conclusion**

Decision Support System plays a vital role for organized apparel retailers. There is a tremendous change in the type of DSS in retail outlet, as development in affordable technology results in growing use of more sophisticated DSS tools. Study indicates that apparel retailers are keen to invest in DSS systems as long as ROI is assured. There is a tendency to use customized DSS developed by a local supplier as per the needs. During the development and implementation phase few teething problems are faced but once sorted out through close interaction and feedback, DSS becomes operational and scalable. It appears that Indian apparel sector is in a trajectory and new players are keen to enter with latest DSS tools to use information for decision making which may provide them a competitive edge.

## References

1. Dale B Achabal et.al. "A Decision Support System for Vendor Management Inventory", *Journal of Retailing* Vol. 76, No.4, pp 407-413.
2. Gallegos Frederick, "Decision Support Systems: An Overview" *Information Technology*, Winter 1999, Vol. 15, Issue 2, PP 42-46
3. Eom S B, et. al., "A Survey of Decision Support System Applications (1988-1994)", *The Journal of the Operational Research Society*, Oxford: Feb 1998, Vol.. 49, Issue 2, pp 109-121.
4. Little J.D.C., "DSS for Marketing Managers" *Journal of Marketing*, 1979, 43 (3), pp 9-26.
5. Barnes, Liz; Lea-Greenwood, Gaynor, "Fast fashioning the supply chain: shaping the research agenda", *Journal of Fashion Marketing and Management*, Volume 10, No. 3, 2006, pp. 259-271 (13).
6. Doyle, Stephen A.; Moore, Christopher M.; Morgan, Louise, "Supplier management in fast moving fashion retailing", *Journal of Fashion Marketing and Management*, Volume 10, Number 3, 2006, pp. 272-281(10).
7. Sheridan, Mandy; Moore, Christopher; Nobbs, Karinna, "Fast fashion requires fast marketing: The role of category management in fast fashion positioning", *Journal of Fashion Marketing and Management*, Volume 10, Number 3, 2006, pp. 301-315(15).
8. Tyler, David; Heeley, Jo; Bhamra, Tracy, "Supply chain influences on new product development in fashion clothing", *Journal of Fashion Marketing and Management*, Volume 10, No. 3, 2006, pp. 316-328(13).
9. Bruce, Margaret; Daly, Lucy, "Buyer behaviour for fast fashion" *Journal of Fashion Marketing and Management*, Volume 10, Number 3, 2006, pp. 329- 344 (16).
10. [http://www.imagesretail.com/cover\\_story2.htm](http://www.imagesretail.com/cover_story2.htm)
11. Ahuja Amit, "Techno Visual Merchandising" unpublished paper, NIFT, Gandhinagar, 2006-07.
12. Al Ries & Laura Ries, "The Fall of Advertising & The Rise of PR," 2002, Harper Collins Publishers Inc., New York, 295p.
13. [http://www.raymondindia.com/oc\\_his.asp](http://www.raymondindia.com/oc_his.asp)
14. [http://www.tata.com/tata\\_strategic/articles/20060925\\_retail.htm](http://www.tata.com/tata_strategic/articles/20060925_retail.htm)
15. [http://www.imagesretail.com/india\\_retail\\_report.htm](http://www.imagesretail.com/india_retail_report.htm)
16. Angehm, Albert A, Jelassi Tawfik, "DSS Research and Practice in perspective", *Decision Support System*, Amsterdam: Nov 1994, Vol..12, 4, 5: pp-267-276.