CHAPTER III
E- PROCUREMENT MANAGEMENT IN GARMENT INDUSTRY

This chapter deals with the supply chain and logistics aspects of e-Procurement, in the Indian garment industry with introductory comments on procurement per se. Procurement is the purchase of goods or services at an optimized cost with quality. Procurement happens in all institutions- government organizations, non-profit institutions, and business establishments, besides households. Procurement processes entail quality and quantity checks in addition to purchases. Listed suppliers are pre-determined in making the process smoother and promote a healthy relationship between the buyer and the supplier. Procurement processes differ in nature as each institution might define a different procedure for procurement. Procurement depends on the availability of material, access to global/regional/national/local markets, market competitiveness, unpredictability and price. Efficiency in purchases can lead to significant savings even in low volume purchases. The general practice is the procurement department determines selecting an optimal source of supply, ensuring a reasonable price, establishing and maintaining mutually beneficial relationships with suppliers, timely delivery by the efficient mode of transport and the like.

3.1 Understanding Procurement

Though the terms purchase and procurement are used as synonyms, they are different. Purchase is a transactional activity and is a function of acquiring goods and services. Purchases manage materials information and flow to derive lower cost. Procurement encompasses additional management activities in a purchase and ensures purchases are appropriate. Procurement is also about developing a strategic supply channel for lowered total costs. The definition of procurement in simple terms can be "the process of identifying and negotiating possible vendors for supply of goods and services and entering into an agreement with vendors for the company" [ccc]. In businesses, the word procurement refers
to many procurement practices with the aim of finding, evaluating and engaging suppliers of goods and services [\textsuperscript{cxxx}].

Procurement practices have existed from 3,000 BC. Egyptian pyramid design scribes also played the role of clerks. They recorded materials and labors needed in a construction. Romans contracted private suppliers for their empire. William the Conqueror of Great Britain recorded tax collections in a crisp. This process evolved into tracing goods or services in British Empire in its colonial pursuits. During the period of Industrial Revolution, Procurement was a worker’s skill set. Manufacturers hired “materials men” for material acquisition and transportation. These men negotiated with suppliers on price for reduced manufacturing costs. Even during the 20th century, these roles were considered a lowly function and World Wars reduced it to clerical status. Only after the 1960s, businesses started recognizing procurement as a management function.

3.2 Indian Garment History– The Supply Chain Preludes

India’s textiles sector is one of the oldest, contributing to its economy. The history of Indian garment industry dates back to 3000 BC. Yes the industry is some 5000 plus years old. The market was worldwide. The technology was supreme. Indian garment industry with diverse fibers, created intricate woven products with manual looms. India’s organic dyes attracted buyers from the globe for centuries. British colonization of India and its industrial policies destroyed India’s eco-system while making it technologically bankrupt.

After independence, India increased its capabilities in garments, diversified its product base, and thus emerged as an important global player. Currently, textile sector is a large contributor to India’s exports and averages above 10 per cent of total Indian exports. This organized sector includes apparel and garments, which apply modern techniques and machinery. The sector employs above 90 million workers, direct and indirect. India's overall textile exports for 2015-16 were US$ 40 billion and are expected to reach above 220 billion by 2021. The industry can produce products suiting different market segments, both in the Indian and global contexts. Many Indian states encourage investments in the garment sector with new textile policies for attracting investments in the textile and apparel sectors. India also is trying to expand its exports to Russia, Japan, Brazil and China, in addition to the
existing EU and US markets. The Indian Vision and plan for Indian Apparel Sector, aims at 20% growth in exports in the next decade with an annual growth rate of 12% in the domestic market. In this context, Supply Chains assumes significant stature with diversity in raw materials/tools/machines, spinning, extrusion, processing, knitting and the like. An extensive supply and distribution channel is depicted in figure 3.1.

![Diagram of Apparel Supply Chain](http://searchingforstyle.com/2010/07/fashion-101-the-fashion-supply-chain/)

**Figure 3.1: The Garment Supply Chain**

It is evident from figure 3.1 that the Indian garment industry in the past, focused on pre-finished goods and products supported by handlooms and power looms. Textile mills produce raw material for apparel and textile products using natural or synthetic. The apparel sector later became a value added output. The labor-intensiveness of the garment industry forced developed countries to hire Indian manufacturers for garments. Since, the garment and apparel sector is based on suppliers, cloth, labels, threads zips and buttons, it is also dependent on both in-bound and out-bound logistics.
Every purchase department in a garment firm, especially in a readymade garments segment, has the following major functions: Direct procurement which is exclusively meant for production activities; in-direct procurement is meant for maintenance and other allied activities; more than 60% of the raw material consumption is based on the specifications made by the buyer; the buyers could be exporters, global retail giants or agents of global retail network. In most of these cases, the buyers propose the names of certain suppliers and they are referred to as the ‘nominated suppliers’. Theses suppliers are linked with the buyer (who places orders with Indian garment firms for manufacturing or stitching), logistics players (who help the suppliers by reaching the ordered goods to the manufacturer) and the actual manufacturer (Indian garment or readymade garment firms). In the absence of ‘nominated suppliers’, manufacturers procure goods from various sources and also follow the regular SMS (Sales Man Samples) route to identify right raw materials before purchasing the same for their requirement. Among these methods, besides e-Procurement, SMS plays a major role among the purchase officers or purchase department. This is mainly because of the need for ‘touch & feel’ quality assessment for various fabric & accessories. Hence, raw materials would be accessed physically and then the rest of the processes would be through the e-Procurement process.

Moreover, in most of the cases, the raw material and its quality is decided by the buyer, across each stage of procurement. Professional purchases in relevance to other functions of a firm increased \[^{xxxii}\]. As competition increases, supply environment became more volatile ending in global sourcing. An imperfect raw material supplier can result in long waits for supplies or receiving substandard supplies. A company cannot function without proper supplies. Improper negotiations can result in lowered profits or a loss. Many industries are abandoning low cost suppliers and employ multidisciplinary procurement teams for a proper selection methodology in choosing the best supplier for each component. In the textile and apparel sector, companies need to meet customer needs on a timely basis with quality products and lowered costs. This is the key to competitiveness. Swift sourcing and replenishment are two key factors for success in global supply chain management, thus increasing the importance of selection and audit of supplies. \[^{xxxiii}\] \[^{xxxiv}\]

3.3 Procurement and Supply Chain Management
Supply chain in manufacturing can be defined as a set of interrelated activities in product delivery or services to customers. The activities encompass raw material acquisition, production, information on raw material transformation into a product or service, logistics and movements in/out, management of intermediaries and external entities involved in the process. Each activity may fall under a department and move to the next department where the forwarding department becomes an internal customer to the forwarded department [cxxxv].

The main thrust to build a supply chain is improving service levels provided to the customer and thus build a competitive advantage. Supply chain management is the integration of business processes and optimizing interrelations between departments for delivering goods or services from suppliers to customers in an effective way. Therefore, the goal of the supply chain management is to optimize the resources, quality service, reduce inventories, decrease costs and improve speed of operations with a continuing improvement. Integrating SCM management operations helps achieve high performances and thereby increase competitiveness.

SCM has gained immense importance in current economy due its effect on a company’s performance. Managing supply chains are complicated and challenging [cxxxvi]. The key dimensions that forms a strategic supply chain are, procurement, demand flow, customer service and integration strategies. The increased importance of the supply chain is forcing organizations to evaluate purchase and procurement strategies, which are the first link to accomplish the supply chain goals. At the strategic level, long-term purchase decisions influence an organization’s position in the industry. They include establishing long term contracts, sourcing strategies, procurement strategies, investment decisions, design, quality and logistics. “Procurement is the blueprint to supply chain”. Some literatures use the term procurement for supplier-related activities; however, this work uses the term procurement to encompass purchase activities.

3.4 Procurement and Logistics in Garment Industry
Garment is one of the oldest and largest export industries in the world as most nations produce for international markets making this sector a global sector industry [xxxvii]. They are the ‘starters’ for countries engaged in export-oriented industrialization and play a leading role in developing economies like India. Technology and Infrastructure are key drivers at every stage in an export oriented apparel supply chain. Stages of this supply chain include logistics, buyers, manufacturers and intermediaries. Procurement deals with the purchase of right material and right quality. It is a department working in line with the strategy of organizational goals. Logistics is managing delivery. It ranges from JIT (Just in Time) to planned delivery (lead time). Management of time precisely is essential for material to be delivered before time in a factory. There are various strategies like, logistics godown, intermediate warehouses, one container load or one truckload, etc. The materials are the building blocks of an actual product, but the materials do not magically appear. In other words, an entire section of the supply chain must be devoted to purchasing, shipping, organizing and storing these various components at the procurement warehouse. If the flow of procurement logistics becomes inhibited, it could undermine production in manufacturing centers and subsequent storage warehousing, creating a strain on the distributor and customers.

Every cost associated with manufacturing a product increases its value. If a manufacturer must pay 10-percent higher costs of raw materials, the resulting spike in charges may cause an increase to the end-user. Also, the type of raw materials purchased can involve lengthy supply chains, such as an international transit of raw minerals from other sites to the manufacturing center. Procurement management is all of the processes that go into managing a company’s incoming material needs for manufacturing. This may include obtaining bids from third-party logistics (3PLs) providers, the creation and negotiation of contracts with such providers, the hiring of employees and drivers, and marketing and business professionals. Each job plays a critical role in ensuring the costs associated with manufacturing do not exceed the company’s expectations. Often, a whole procurement management team may be hired for large organizations or corporations. But, small-business owners may lack the resources to hire all of these professional at the onset of manufacturing. As a result, working with a 3PL directly may be the best way for a new or growing organization to gain access to all of the resources necessary to build a successful enterprise.
Majority of apparel businesses runs on an indirect export mode as overseas buyers have procurement intermediaries for coordination with apparel manufacturing units. Thus Apparel supply chain requires efficient coordination between important players in the process. Procurement intermediaries have an important role in international trade as they enhance productivity, improve distribution efficiency, open up new markets, minimize costs and help overcome trade barriers.

At an organization level they speed up information flow in a supply chain and help improve communications between buyers and sellers. They also coordinate material flows between customers and suppliers. Clients in searches for new trade opportunities, product sources and integrating supply and demand require their help. Their main responsibilities are to communicate between buyer and supplier, solving problems, identifying suppliers and expanding suppliers base, quality control and timely execution of export orders with desired quality levels. Procurement agents are well versed technically in apparels, existing cultures, and economic and political trends.

A network of production contacts is critical in international procurement where buyers and sellers are separated geographically; [^{xxxii}]. International procurements help firms to be innovative while improving quality. Lowering of trade barriers has also encouraged such procurement alternatives. Alternative procurement from low cost countries when price is a motivating factor may deter quality and become a major issue. Risks in global procurement includes transportation delays, inefficient technology, absence of proper inventory management, currency exchange rate fluctuations, import export regulations, trade regulations, lack of knowledge on foreign business practices and economic stability; Such risks in global procurement can be categorized into Logistic support, quality and reliability and regulations [^{xxxii}].

The works identified are Transportation and logistics, Logistics infrastructure, local logistics, industry competence, Business environment, Manufacturing, supplier capability, communication network and information technology.

The processes can be broken down into specific categories of procurement logistics, which include the following:
• Product Policy – This part of the procurement logistics operation revolves around the “Big Picture” of the product being built. It may include packaging materials, manufacturing details and warehousing considerations.

• Terms and Conditions – This part of procurement logistics focuses on the “fine print.” Does a provider of procurement logistics offer auditing services, ability to access additional resources and other specific details? Some providers may even have access to faster transit lanes for imports, making the whole supply chain more productive. Ultimately, the terms and conditions are laid out during contract negotiation.

• Communications Strategy – The communications strategy is how a company decides to make a product available. Will it include multiple factories, regional distribution centers, and lengthy marketing advertisements? In other words, each part of the communications strategy will require materials from the procurement to make a product more readily available to all customers and business-to-business partners. This part of procurement logistics, explains DII, can be among the most intense parts of the procurement logistics supply chain. Furthermore, communication can mean the difference between the success and failure of a new or upcoming product.

• Purchase Strategy – The purchasing strategy is how a company decides to go about obtaining the materials needed for manufacturing. In other words, an optimized purchasing strategy can collect materials from a variety of suppliers, analyze current supplier market trends, and select the best means of obtaining materials at the lowest prices, without sacrificing quality. This also drives competitive advantage among suppliers, helping to keep prices from skyrocketing. This section of the procurement logistics supply chain also includes the actual work with 3PLs, if applicable.

3.5 Issues of Logistics in Indian Garment Industry

Indian garment companies face a number of problems like non-availability of suitable finished goods, limited resources, absence of organized marketing, Lack of infrastructure and competition from large-scale units and imported articles. Though India is the second largest garment manufacturer after China and its raw materials like cotton are cheaper, the
garment firms are facing problems. There are many procurement issues related to product sampling, production, lead-time, quality, inventory, transportation etc. Information technology can improve a company’s ability to gain visibility in its own systems and ensure sharing of information much easier.

The speed, cost, accuracy, and reliability of advanced technology have raised buyer’s expectation for high responsiveness and greater visibility.

**Certain Gaps:** Manufacturing and supplier capability indicates towards the production efficiency to make right product in right time and quantity with right specifications. The logistical challenges currently faced by the entire international apparel industry include poor quality of physical infrastructure services such as road, rail, waterways, port services, and interfaces, policy and institutional constraints—such as procedural red tape, inadequate enforcement of contracts, poor definition and enforcement of rules of engagement, delays in customs, delays at ports and border crossings, pilferage in transit, and highly restrictive protocols on movement of cargo [9]. The delivery date is often not met for a number of reasons, such as the lack of container trucks, overloading, rough handling of freight, defective containers, discrepancy of standards as well as a lack of understanding between shippers and logistics providers. Local protection regulations, lack of well-trained local work force are major hindrances too. Logistics inefficiencies harm the competitiveness of private firms through their effects on both cost and time. The costs relate not only to the direct costs of transporting products but also goods in transit incur indirect costs such as inventory holding costs. The longer the transit time, the higher are the costs. Other indirect costs are incurred when delivery times and reliability are uncompetitive, severely affecting a country’s position in highly competitive international markets demanding just-in-time delivery [10]. In spite of all existing challenges, manufacturing off shoring to low cost countries is a well-established trend and touched about US$4,500 billion in 2015.

**Global competition:** The increased need for global competitiveness is driving many firms, particularly those in fashion industries, to identify and establish relationships with suppliers in low-cost-countries. Price being one of the prime reasons to source products from Low
cost countries (LCCs) like India, Mexico, other Latin American and East European countries. Also, Procurement is a two-pronged issue in the apparel industry. It becomes more complex as the amount of unique raw materials, ingredients, parts, components, connectors, apparatus, products, equipment, supplies, and services increase and the numbers of buyers involved in the decisions expand. The risks of buying the wrong items, services or from the wrong supplier can have major impacts and ripple throughout a business.

**Perceived consequences:** Consequences can range from late delivery to total service failure liability and can even affect market competitiveness. In addition, if the selected suppliers cannot provide opportunities to reduce costs improve and upgrade product/service offerings or provide other market-facing advantages, then an organization can quickly find itself losing market share. The problem of raw material has assumed the shape of (i) an absolute scarcity, (ii) a poor quality of raw materials, and (iii) a high cost. Earlier, the majority of Garment Industries mostly produced items dependent on local raw material. But, ever since the emergence of modern small-scale industries manufacturing a lot of sophisticated items, the problem of raw material has emerged as a serious problem on their production efforts. The small units that use imported raw material face raw material problem either on account of foreign currency or customs duty or any other reasons. Even the Garment Industries that depend on local resources for raw material requirements facing various problems.

**Pain points:** But these units are not in a position to liaise with the official agencies and are left with inadequate supplies of raw material. As a result, they have to resort to open market purchases at very high prices. This, in turn, increases their cost of production, and, thus, puts them in an adverse position compared to large units. The quantity, quality and regularity of the supply of raw materials are not satisfactory. There are no quantity discounts, since they are purchased in small quantities and hence charged higher prices by vendors. They also experience difficulty in procuring semi-manufactured materials.

**Role of SCM professionals:** SCM industry created professionals, who engaged in supplier competition and who had the ability to gauge supply variables like price, quality, durability and availability. SCM professionals became a critical factor to a company’s success. With
the growth of Internet, procurement took on an even more dynamic role in the late 20th century, engaging in B2B e-commerce transactions. Given its increased importance of late, especially with the onset of more accessible technology, procurement may become even more important, especially when the practice can be part of a long-run solution to an economic downturn. Procurement has assimilated primary importance in current businesses. Major companies dedicate departments and executive positions to procurement. Despite these changes, the types of challenges addressed by procurement, from scarcity of supplies to competition have mostly remained unchanged.

3.6 Procurement Initiatives in Industries- Garment Industry to Learn & Imbibe

Throughout history, invention and adaptation of new technologies have helped in increasing the productivity of the business organizations. In industries technological advancement over the past decade has mainly focused on the plant design and manufacturing process improvement.

At the same time, the process of physical movement of raw materials, components and products through a firm’s value chain comprises a significant portion of the total cost of goods in many industries. But in recent years total scenario of business has been changed. Technological advancement in the field of telecommunication network and information technology has changed the business processes. Online procurement (e-Procurement) is a technological solution to facilitate corporate buying using the Internet and other Information and Communication Technologies (ICT). In other words, E-Procurement is the electronic (B2B or B2C or B2G) sale and purchase of goods and services. The medium used might be the Internet or any media like EDI (Electronic data Interchange) and Enterprise Integration.

According to the studies of Croom [^c1], de Boer et al. [^c1], on purchasing and e-Procurement, and e-marketplace, “e-Procurement is organization’s procurement using the Internet technologies, including e-design, e-Procurement, e-negotiation and e-evaluation”.

The purpose of e-Procurement is to reduce cost and to improve operational efficiency in the procurement process. Note, e-Procurement, the technology dependent gateway focuses on
cost reduction as to “PET” – Process, Efficiency and Transactional. Given the potential benefits of the Internet and other web-related technologies to revolutionize the procurement process, numerous companies worldwide have already adopted e-Procurement in an attempt to leverage this technological infrastructure. Typical purchase activities might involve several activities like data aggregation, sourcing strategy, catalogue buying, RFX (a catch-all acronym that captures all references to Request for Information (RFI), Request for Proposal (RFP), Request for Quote (RFQ), and Request for Bid (RFB), selection of vendor and vendor management, requisition, approval workflow, supplier enablement, catalogue Management, Ordering, Invoicing and Managing payables/receivables as shown in Figure 3.

![Diagram of e-Procurement activities]

Figure 3.2: e-Procurement activities

### 3.7 E-Procurement Constraints

Following are some constraints for the implementation of E-Procurement systems in India:

- The lack of IT infrastructure
- Lack of security
- Limited broadband facilities in rural areas
- But, keeping aside the limitations, the E-Procurement system has much positive side. Some of these are given below:
  - Reduced administrative cost
  - Shortened order fulfillment cycle
  - Increased technology collaboration and planning with business partners.
Reduce wastage of manpower and labour hour etc.

Indian and global research reports such as Gartner report, McKensy report and other research agencies too emphasize the fact that there are multiple challenges that needs to be addressed.

**Views on e-Procurement Practices and Problems in Garment Industry:** In-depth research, qualitative research methodology, was initiated across various stakeholders for a real view of the market in terms of e-Procurement. The meetings and interviews were lengthy in-depth discussions on various parameters of e-Procurement. Most of the respondents met by the researcher were manufacturing garments for domestic and global markets. The researcher also met the domain experts in respective process of e-Procurement for a tech-savvy qualitative analysis. The instruments used for qualitative analysis was through personal interviews, in-depth discussions, view point of the experts and questions.

**3.8 Technology Trend in Procurement in Garment Industry and Industry status in receiving the technology**

In a traditional garment industry, procurement process is the lengthiest one in the entire supply chain. This specifies the need to have clarity on demand forecast, consumption pattern, stock maintenance and quality status and so on.

Lot of research reports repeatedly mentioned about existing in-efficiencies across process; sample development, test manufacturing, quality issues handling during product return and product dispatch to final production. In a typical procurement to manufacturing cycle, manufacturing or the actual production is just 25% of the entire supply chain operation. Majority of time is spent on information collection, processing, analyzing and preparing for the next stage of supply chain. But unfortunately, in majority of the firms, during the procurement process, importance is given majorly to invoicing and payment operation. Over the years, many software solutions providers have tried and tested multiple solutions to improve the process efficiency. Implementing technology across procurement department has been on the rise. Today’s technology has solutions for most of the touch points across Garment industry. Through IT, we can manage information efficiently and at faster speed.
Presently, barcoding and EDI (Electronic Data Interchange) are the most commonly used technology to integrate information.

Role of procurement specialist is changing from inventory ordering and pricing to procurement strategist. With present barcoding and EDI, this transformation is not possible. Barcoding has it's own limitations. In case of any obstruction, barcoding readers cannot capture the information. Change of process invites new barcoding/process mapping and making these changes increase the Opex (operational expenditure). There are lots of critical functions in the garment industry; washing at both normal and high temperatures, dyeing, frequent ironing and trimming etc. At each stage, data capturing becomes very important (barcoding gets damaged mostly during this process). Hence, there is a need to capture this information across stages, manually or automatically so that process efficiency could be enhanced.

There are lot of upcoming technologies that are now taking advantage of the need across various industries and their interest to look out for cost effective standalone solutions and certain key technologies that can solve their age-old problem. Potential technologies that can give a different facelift: are: RFID, IoT and Predictive analytics / Big Data Analytics / BI (Business Intelligence).

**RFID:** Presently, among the respondents, majority of them are focused only on product tracking; this is majorly by using barcoding as it considered to be the cheaper than implementing RFID solution. As of now, there is no data captured to analyze the delay in the external process that happens either before or after production. Manufacturing line is monitored to ensure proper flow of material supply. Manually, in some of the process, data are captured. But the biggest challenge is in data integration. If integration were not done across, interpretation would be a failure. Moreover, in certain process, manual data capturing is practically not possible and hence need a technology to support the same.
The major players in RFID technology in Procurement are: Alien tech, IMPINJ, Insync, adverity dennison, Checkpoint, Infor, Globe Ranger, etc.

**IoT:** IoT is the most spoken about technology in the supply chain process. Solutions mentioned are the possible solutions that can be provided by an IoT solution provider. During in-depth discussions, it was very obvious that majority of the respondents were not aware the exact benefits that these technologies could bring to the table. For IoT to be successful, with both internal & external operations, these companies need to be fully web-enabled and on cloud. Interestingly, ERP providers or SCM providers do not provide these services directly in majority of case. There are multiple players, new age technology players, who provide these services.

Major IoT players are Filament, Vodafone, Helium, konux, Hologram, Notion, Bastitle, Samsara.

Typically IoT has two parts, hardware and software. Majority of players offer software and have tie-up with local players for the hardware. All these IoT players need to tie-up with
telecom providers; sim card is used to transmit and receive the monitored information. Globally, research indicates that many procurement firms have still not focused on IoT for monitoring; RFID gets extended into the monitoring process. But IoT, helps in remote monitoring.

**Big-Data analytics:** In an industrial process, data can be captured in multiple forms. But, if the data captured are not put to right use, there is no value to the efforts made. To make effective interpretations, data needs to be captured at appropriate touch points and using proper tool in a proper format.

If technology were properly used to capture information across points, most of the garment industries would be sitting on a huge pile of data. To make use of these data and derive actionable points, data analytics software/business intelligence (BI) software is required. Some of the ERP/SCM players claim that they have BI built in their suite; majority of these players try to make this as a separate module and sell it based on demand from the garment industries. Companies that don’t have knowledge on this are not aware of the need of this module and what it can do for them. Implementing technology has steadily increased in recent years and equal importance, is the role of the human in the process. No digital solution can be successful without a human intervention. Hence, people need to be trained on the changing process and technology.
Oracle and SAP were the most used ERP packages in large-scale companies. These firms used full-fledged ERP package in their organization. Microsoft dynamics, Ramco On Demand – Procurement, HR module were some of the frequently used ERP/SCM packages by medium sized firms. These kind of players offered pay per use model. While full ERP package costs in crores, pay per use model came in as a big relief to the garment industries. But these firms were focusing on standalone solutions; some of the industries had multiple software for various processes. Integrating these is the biggest challenge.

More than 50% of the audience who were small and medium player, preferred solutions developed by local software developers. These developers provided solutions at around 3-5 lakhs and charged a minimum maintenance charge. Hence majority of the players preferred a solution provider who can customize the product based on their need.

3.9 e-Procurement system features and practices

The focus of the meetings was on whether companies had IT enabled services oriented towards e-Procurement

- e-Procurement as a part of your supply chain management system
- e-Procurement system manages a broad set of services categories to meet the diverse needs of different department within organization
- The impact of e- procurement system on formulation of strategic/operative objectives like tracking of stocks, discount, negotiation-edge, product improvement mix etc.) is high.

During qualitative discussion with N. Sekar, Owner, Channel Creation and Ms. Chitra, Purchase Head, Dignity Innovations who use e-purchase software, they said, “Software is within the company premise; we don’t use cloud and we don’t connect departments”. Even big players, feel that majority of communication is only through e-mail and e-Procurement has not taken over the India market, especially among garment players. In the accessories market, the situation is better.
3.9.1 Purchase pattern in the garment industry strategic objectives

Mr. Venkatraman, Purchase Head of IS Fashion, which exports to Europe, US and UAE markets and Mr. Vasudevan, Purchase Head, Imperial Fashions were open about their views on the e-pattern across their industry. “e-Procurement is functionally possible only when both, the buyers and the suppliers are e-connected and have proper infrastructure to enable e-purchase. In garment industry, there are different cases of production. For Indian garment firms executing export garment orders, majority of supplied materials become an issue. The orders are pre-planned based on design and the receiving suppliers are not online. Tracking ensures stages in delivery of materials. Internally, most of the firms use to track the delivery of goods, their quality and the quantity status. High technology spends prevents interconnectivity among these systems. Software is used for identification of product varieties and vendors list, but negotiations are done offline. These companies lack consistency in purchase patterns as the order based material needs keeps multiple suppliers on board. This functionality needs frequent updation”

‘ISUX Fashion’ uses in-house ERP software developed by an IT team. Upgrading the software becomes an issue when IT teams change and new features are not updated or added. Most of the firms, especially in the SME segment are reluctant to purchase required IT solutions from software companies, as they feel in-house or local software developers expertise can help in making tailor made software to suit their needs. These are standalone software versions and have trouble upgrading. Surprisingly, the cloud factor never came up in discussions with the respondents. Majority of respondents used standalone software for purchases.

3.9.2 e-Procurement helped in building long term relationship with vendors and suppliers

Mr. Venkatraman, Purchase Head of Evolv Clothing highlighted the lack of relationships that prevailed in the new age multiple supplier ecosystems. Companies look out for new vendors/suppliers and are dependent on the company that uses corresponding software. The term, relationship, depends on multiple factors; size of the company, type of
products sourced and the market from which it is sourced. Smaller players go by relationships as their supply need is limited and for them, it would be cost effective to strict to a single supplier and be loyal to each other. In case of a larger player or a manufacturer who is dependent on multiple global orders, loyalty & relationships are secondary. In case of large factories, supplier need is based on: quantity, quality, varieties, fabric or accessories, supplier authorized or not and so on. Based on these factors, the manufacturers have to decide the supplier.

3.9.3 Supplier performance, cross border business and accessing broader supply base

During in-depth discussion, it was very obvious that in 100% export oriented company, all the above-mentioned features & practices may not hold good. For such firms, foreign buyers place orders. In most of the cases, the buyer gives product/accessories specification and the supplier database. Only in few cases, Indian firms identify suppliers, visit them and negotiate for better rate. This is a highly price sensitive market. In such firms, to get cost efficiency, e-Procurement helps in increasing supplier base; in some case, get opportunity to do cross border business.

To further substantiate the discussion, respondent’s attitude/their levels of agreement, in terms of scores based on 5-point scale are dealt in Chart 3.1.

![Chart 3.1 e-Procurement - Features & Practices]

Indian firm need to re-look price pressure from the supplier and focus on increasing process efficiency.
Chart 3.1 captures views to various questions discussed with garment firms. The data are scores obtained by converting frequency (that is, number of respondents) checking different opinions with 5 points for strongly agree (SA) response, 4 points for agree (A) response, 3 points for neutral (N) response, 2 points for Disagree (DA) response and 1 point for strongly disagree (SDA) response. There is a near total agreement; on the part of the respondents that e-Procurement is a part of SCM, with 224 points out of theoretical maximum 250. As to services for meeting the procurement department needs, there is also near total agreement with 217 points. 151 points were accorded by the respondents as to the impact of e-Procurement on meeting strategic/operative objective. Interestingly, and painfully too, there has been a mixed reaction to the key aspect of building and maintaining relationships with the vendors, vouched by poor score of 147 that went in its favour. In terms of volume discount and negotiation it is less favorable.

The initiatives of e-Procurement, performance improvement, cross border business opportunities and accesses to broader supply base are the most accepted key features of e-Procurement.

**Test of Hypothesis**

To test whether the e-Procurement procedures and features have been received with positive frame of mind, with mean score of 3.5 points as bench mark requisite, test of significance of mean was done, against the actual mean is 3.906.

<table>
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<th>H1: Mean score &gt;3.5</th>
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<td>H0Rejected</td>
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</table>

The calculated modulus Z, 8.76296, exceeds 1.645 the Z score at 5% significance level and the null hypothesis is rejected emphatically. The opinion on e-Procurement practices and
features is comfortably positive with score exceeding the benchmark set at 3.5 and the mean is very close to 4.

3.10 Value chains involved in e-Procurement

In-depth discussions were made with multiple firms to understand the need for e-enabled services for **e-Auctioning and Indent management (workflow in preparation of tenders)**

In tender application, most of the respondent’s preferred manual tender process, as in case of e-filing, many documents were confusing and tough to understand and fill in the exact details. In few cases, the yarn and cotton procurement team adopted e-auctioning. Some garment firms did not need e-auctioning and indent management. Manufacturers of accessories, who focus on products (batches, zippers, buttons), felt that e-Procurement was not lucrative.

3.10.1 Vendor, Catalogue and Contract management

Mr. Stalin, Purchase Manager, SKL Exports, S. Ravi, Purchase head, Sri Krishna Knits, and N. Sekar, Owner, Channel Creation and few more clearly explained how “Vendor management is one of the most effectively used software and material supply notification was done using this software”

In-depth analysis highlighted the fact that catalogue management is not mandatory/required for 100% EOU as most of the garment manufacturers operated on regular clients and suppliers and thereby reducing the need to maintain a catalogue. Invoicing/Contract management is a part of the purchase software. Some companies were using Tally accounting software for invoicing and contract management.
Chart 3.2: Value chains in e-Procurement

Chart 3.2 clearly indicates the view of respondents who did not consider indent management or e-auctioning as an enabler in the e-Procurement process. Though vendor management had wide acceptance, contract management was not a priority for them. Accessory suppliers showed a mixed response in the use of supplier maintained e-catalogues, since the respondents were not sure on the practicality of the process considering IT infrastructure.

**Test of Hypothesis**

To test whether the e-Procurement has been accepted as a value chain with features of intent management, e-auctioneering, vendor management, catalogue management and contract management, test of hypothesis was done with bench mark mean score of 3.5 on a 5-point

<table>
<thead>
<tr>
<th>H₀: Mean score = 3.5 (on a 5 point scale.)</th>
<th>H₁: Mean score &lt; 3.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>609</td>
</tr>
<tr>
<td>Mean</td>
<td>2.436</td>
</tr>
<tr>
<td>SD</td>
<td>0.886</td>
</tr>
<tr>
<td>n</td>
<td>250</td>
</tr>
<tr>
<td>Sq. of ‘n’</td>
<td>15.81139</td>
</tr>
<tr>
<td>SE</td>
<td>0.056036</td>
</tr>
<tr>
<td>Z</td>
<td>-18.9879</td>
</tr>
</tbody>
</table>
scale with the actual mean of just 2.436.

The calculated modulus Z, -18.9879, exceeds 1.645 the Z score at 5% significance level and the null hypothesis is rejected emphatically. The opinion on e-Procurement as a value chain proposition is rejected with mean score very much on the lower side of the benchmark set at 3.5 by the researcher.

<table>
<thead>
<tr>
<th>Value Chain</th>
<th>$O_1$ for Agree</th>
<th>$O_2$ for Disagree</th>
<th>Total</th>
<th>$E_1$ for Agree</th>
<th>$E_2$ for Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indent management (workflow involved in preparation of tenders)</td>
<td>2</td>
<td>48</td>
<td>50</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>e-Auctioning</td>
<td>1</td>
<td>49</td>
<td>50</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>Vendor management</td>
<td>23</td>
<td>27</td>
<td>50</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>Catalogue management</td>
<td>22</td>
<td>28</td>
<td>50</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>Contract management</td>
<td>10</td>
<td>40</td>
<td>50</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>192</td>
<td>250</td>
<td>60</td>
<td>190</td>
</tr>
</tbody>
</table>

$H_0$: No Relationship between Disposition (Agree or disagree- Grouped) of Views and Value Chain Opportunities possible with e-Procurement. Chi Square: 48.9.

The $H_0$ is rejected, as the computed Chi Square: 48.9 is more than the table chi-square.

Note: $O_2$ – Observed frequency, $E_2$ – Expected frequency.

It is found that Vendor management and Vendor management have some scope for value chain push up but Indent management, e-Auctioning and Contract management have very slim opportunity. Hence the mean score also fell very short of the benchmark already set.

3.11 Various benefits of using e-Procurement system

Though majority of the garment firms accepts the fact that industries are benefited by e-Procurement, during in-depth study, there were mixed responses from the respondents. JIT Management made possible, Inventory Reporting, Reduced administrative costs, Reduced Overall investment in Inventory, Virtual elimination of paper work, e-Procurement tools enhances business, e-Procurement tools help in cost reduction, Helps in better price negotiations and e-Procurement tools contributed to business certainty are the evaluated benefits.
3.11.1 Reducing Dependence on purchasing agents

Ms. Chitra, Purchase Head, Dignity Innovations, S. Chandran of Purchase Department, Gee Tex, and S. Arun, PH, JSK Garments explained how “e-Procurement has helped in the elimination of middlemen. Companies save 15 to 20 % of procurement cost while using e-Procurement instead of manual procurement. Majority of money is being spent on middlemen as agent commission for sourcing products. Location based sourcing leads to extreme dependency on agents and with e-enabling of systems; companies are exposed to multiple geographies and suppliers across boundaries. It also depends on the software used. An elaborate ERP helps such initiatives but standalone software’s that are used by most of the companies, rarely support such initiatives.” E-Procurement brought down the dependency on purchasing agents. This is the biggest benefit of using e-Procurement software.

3.11.2 Just - in - time Inventory Management made possible and use of inventory reporting & movement control efficiency

The list of objectives for purchasing and supply management personnel includes supporting firm's operations with an uninterrupted flow of materials and services, minimizing inventory investment and loss, developing reliable and effective supply sources, achieving standardization and simplification. There is constant search for new and alternative ideas, products, and materials to improve efficiency and profitability. Procurement function involves monitoring & control of supplier’s performance until the cycle is completed.

In-depth discussion with Stalin, Purchase manager, SKL Export, S. Arun, PH, JSK Garments, N. Sekar, channel Creation, Mr. Venkatraman Gopal, Premier mills gives clarity on how inventory is maintained based on production need and software definitely helps. But, more than JIT, inventory reporting, movement monitoring and control plays a major role in the garment industry.

On in-depth discussions, market highlighted gaps between order winning and order confirmation.
Figure 3.3 depicts the working pattern of supply requirement, as explained by the respondents.

Multiple fabric quality, multiple designs and accessories patterns are involved to fulfill buyer needs. In some cases, the fabric is purchased in advance and undergoes various processes before being sent for stitching in garment industry. The fabrics go through allied processes like stone wash, enzyme wash or dyeing before being stitched, making follow-ups an important issue to get the clothes cleared.

In such situations, e-Procurement might not be useful to fulfill the JIT processes.

However in certain processes like Inner garments segment, JIT would be the need and e-Procurement would be of great advantage.

3.11.3 Reducing administrative and other overheads like traveling, logistics, search, storage or Reduced Overall investment in Inventory

Mr. Stalin, Purchase manager, SKL Export, S. Arun, PH, JSK Garments, Mr. Venkatraman Gopal, Premier mills, Jagan, Aravind Fashions shared their in-depth opinion.
“Though travelling, logistics and search cost seems to have come down, storage cost varies and is dependent on a case-to-case basis. These firms do not have a mechanism to track the cost spent or wasted in warehouse. e-Procurement has not directly bought down the cost of inventory management. Companies with has standard designs to manufacture, e-Procurement can be used to minimize inventory costs and employ JIT which may not be true for companies with mixed orders”

3.11.4 Virtual elimination of paper work and role of e-Procurement tools to enhance business and showcasing cost benefit

Stalin, Purchase manager, SKL Export highlights how e-enabled systems brought in operational efficiency. But e-Procurement did not lead to enhanced turnover of business. e-Procurement has significantly reduced sourcing costs and number of sourcing cycle times. The benefits of e-Procurement can be reaped only if the company uses ERP package or any software that interconnects departments. Standalone procurement software packages will not help in the holistic approach of increased revenue and reduce sourcing costs.

3.11.5 E-Procurement helps in better price negotiations

Mr. Venkat of Aravind Fashions explained how for customers with a regular mandate and consistent designs, e-Procurement helps in identifying multiple suppliers. In the garments industry, with multiple designs and requirements, only selective suppliers exist. e-Procurement only helps in identifying them but does not contribute to price negotiations.

The chart 3.3 indicates responses favorable to e-Procurement processes by strongly agreeing to the fact that e-Procurement play a major role in reducing the dependency on the agents. Majority of respondents agreed on e-Procurement’s role in reducing the inventory investment and sourcing costs, thus helping firms to have better Opex. The respondents could not clearly quantify the benefits in terms of percentage. They also felt elimination of paper work with virtual data entry, but questioned its practical implementation. There was a mixed response to e-Procurement’s role in price negotiation.
Chart 3.3 Benefits of e-Procurement.

<table>
<thead>
<tr>
<th>Benefits of E-Procurement</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>DA</th>
<th>SDA</th>
<th>TS</th>
<th>MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce Dependence on purchasing agents</td>
<td>235</td>
<td>8</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>246</td>
<td>4.92</td>
</tr>
<tr>
<td>JIT Management made possible</td>
<td>235</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>247</td>
<td>4.94</td>
</tr>
<tr>
<td>Inventory Reporting</td>
<td>110</td>
<td>64</td>
<td>36</td>
<td>0</td>
<td>1</td>
<td>211</td>
<td>4.22</td>
</tr>
<tr>
<td>Reduced administrative costs</td>
<td>5</td>
<td>112</td>
<td>18</td>
<td>30</td>
<td>0</td>
<td>165</td>
<td>3.30</td>
</tr>
<tr>
<td>Reduced Overall investment in Inventory</td>
<td>10</td>
<td>172</td>
<td>9</td>
<td>4</td>
<td>0</td>
<td>195</td>
<td>3.90</td>
</tr>
<tr>
<td>Virtual elimination of paper work</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>90</td>
<td>0</td>
<td>105</td>
<td>2.10</td>
</tr>
<tr>
<td>e-Procurement tools enhances business</td>
<td>0</td>
<td>32</td>
<td>108</td>
<td>12</td>
<td>0</td>
<td>152</td>
<td>3.04</td>
</tr>
<tr>
<td>e-Procurement tools help in cost reduction</td>
<td>0</td>
<td>176</td>
<td>15</td>
<td>2</td>
<td>0</td>
<td>193</td>
<td>3.86</td>
</tr>
<tr>
<td>Helps in better price negotiations</td>
<td>25</td>
<td>16</td>
<td>111</td>
<td>8</td>
<td>0</td>
<td>160</td>
<td>3.20</td>
</tr>
<tr>
<td>e-Procurement tools contributed to business</td>
<td>25</td>
<td>144</td>
<td>21</td>
<td>2</td>
<td>0</td>
<td>192</td>
<td>3.84</td>
</tr>
</tbody>
</table>

*Source: Primary Data*

<table>
<thead>
<tr>
<th>Test of Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>$H_0$: Mean score = 3.5 (on a 5 point scale.)</td>
</tr>
<tr>
<td>Total Score</td>
</tr>
<tr>
<td>1866</td>
</tr>
</tbody>
</table>

The calculated modulus Z, of 5.13, exceeds 1.645 the Z score at 5% significance level and the null hypothesis is rejected emphatically. The alternative hypothesis that e-Procurement as a benefit shower with mean score exceeding 3.5 is accepted.

### 3.12 Challenges that could affect e-Procurement

**Mr. Venkatraman, Senior Purchase Manager, Evolv clothing co Pvt Limited,** from his 20 years of purchase experience, shared his experience on how his initial non-IT based procurement system was and how he had to travel a lot to identify suppliers and ensure supply to the e-enabled systems that has helped do majority of his operations from his office in Chennai. In-depth discussion was carried out with Mr. Venkatraman and points mentioned by other purchase heads were used as reference to get a better clarity of challenges that could affect e-Procurement. Majority of them have given a clear explanation across potential challenges.

#### 3.12.1 Data Sharing:

Typically, data sharing is seen as a major issue; in majority of firms, are shared only to the management. In a typical Indian garment industry scenario, but for few large-scale companies who are trying to be partially on cloud, data captured are stored in multiple locations. The supplier data are not coordinated with deliveries and production
schedules, thus conflicting planning and creating confusions. Though, e-enabling processes present a major advantage of presenting multiple scenarios and touch points, lack of inter connection between allied processes leads to mismanagement. The following figure 3.4 depicts the procurement pattern in purchases substantiating data sharing’s importance.

Fig 3.4 indicates, procurement pattern is dependent on the design or sample chosen. Procurement processes also differ based on Samples leading to cross sample data. A multi-style sample would have multiple designs resulting in different procurement needs. Prototypes also change at different stages and even for a minor change procurement requirements change.

Fig 3.4 Purchase procurement pattern as understood from market during research

Hence in such a complex system, absence of information sharing will render data unusable to the purchase department or the management. This leads to non-alignment of production schedules and supplier issues.
3.12.2 Interoperability / Integration issues: The first and foremost challenge in e-Procurement is Interoperability with manual / legacy systems. The development and implementation of e-Procurement has not gone through a smooth phase as projected by software sellers. When companies initiated e-Procurement, it threw up opportunities on data integration and data cross examinations for better planning. Due to the high initial investment costs, there are multiple issues related to implementation and integration with manual systems.

Thus, Interoperability is a major issue for most of the companies.

Integrating data of multiple stakeholders are seen as the biggest challenge; suppliers have software developed on their own local platform. Moreover, new technologies come on different platforms. The high investment cost and technical knowledge of their employees put them away from automating procurement.

Departments capture data in standalone systems while data resides in a centralized location in Legacy systems making it difficult to construct and consolidate this data. Moreover, procurement information is shared only with the management to keep them updated about inventory status.

Upgrading from legacy systems to e-enabled systems, managements face challenges. Though initial cost of conversion and maintenance cost is high in the on-premise model, most companies invest on standalone in-house software for implementing e-enabled services and ERP.

3.12.3 Relationship between buyer and seller

Repeated purchases or long-term relationships with a vendor rely on customer satisfaction. Buyer’s repurchase of goods or services largely depends on Interpersonal connection and satisfaction. Personal satisfaction is an important component for repeat orders. e-
Procurement is digitized and the industry loses personal relationships between buyers and suppliers, thus creating an issue. Relationships are important for understanding of customers, in after sales service, deliveries and salesmen. Though major manufacturers were comfortable with e-Procurement and maintained relationship with their suppliers, small and medium industries thrived on relationships with dealers.

### 3.12.4 Implementation problem

**CAPEX:** IT industries always project only the CAPEX while selling. The garment sector is not aware of the operational expenses in the form of training cost, IT support cost, cost of upgrades and maintenance. Some e-Procurement software cost between 4 to 5 lakhs, which are one-time investments and allow partial customizations. The main challenge is in interoperability between the e-Procurement software and standalone systems. Moreover, these local software vendors do not preempt the hidden cost in terms of upgradation, maintenance and hide the fact that this software’s do not give end-to-end solution to the management.

- **Total Cost of Operation:** e-Procurement leads to an increased ‘TCO’, Total Cost of Operation; in software / hardware implementations, training, maintenance and support. Initialization of e-Procurement incurs a considerable amount of high investment required to sustain the implemented IT processes. Moreover, IT industry has been changing software delivery patterns from enterprise versions to cloud versions creating a Software Demand, thus increasing the cost considerably.

- **Training:** Training e-enabled system users is an important aspect for a successful implementation of IT process. In-house trainings have emerged as a major need in corporate companies. Training new users on e-enabled systems has its own set of unique challenges; culture, language, education background of the trainees etc.
• **Cost of training employees:** With inclusion of new technology and shift in traditional procurement approaches, majority of the industries has emphasized the need for training to enhance business analysis skills for strategic sourcing, supplier analysis etc. Though the resources hired from the market bring in the required talent, the major challenge includes training and customization as per needs of specific departments. The entire respondent’s agree to the fact that IT investment and IT related training involves a considerable cost of implementation.

• **Misuse of orders/threat of hackers & business spying:** Dominance of e-business in the commercial world is increasing causing concerns in security. The biggest concern of managers’ is the security and the trustworthiness of trading partners. Procurement fraud can take a number of forms, from the formation of a cartel to the falsification of invoices. Industry has witnessed occurrence of fraud in initial phases of an ordering process by restricting suppliers or by tampering the procurement processes at a point where audit is more technical. Moreover, in certain cases, frauds can occur in the Pre-qualification stage.

Investigators who can track and trace required data have opportunities to misuse data, which again is the concern in e-enablement. With increasing volume of operational issues data mining is used to detect fraud, tampering or misuse of data. Though software players claim to have overcome these security issues, these are some of the major reasons for the garment industry to prefer standalone operation to cloud.

Further to the indepth discussion with respondents, data captured respondents emotions to see their reaction towards various challenges that were highlighted by the industry.
Chart 3.4 Challenges for e-Procurement

Some of the most key challenges that came through across all the respondents are Interoperability, employee training cost, risk of misuse of orders and threats from hackers. Loss of direct relationship has not been a big issue with large firms; small and medium firms has always felt the gap. Table 3.2 presents the mean scores of the nine challenges of e-Procurement. Except, Loss of direct relationship between buyer and seller, all other challenges are sweeping ones with high scores, exceeding 4.5 and one touching almost the maximum of 5 points.
Table 3.2 Challenges of E-procurement - Average Scores

<table>
<thead>
<tr>
<th>Challenges of E-procurement</th>
<th>Mean Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of data sharing</td>
<td>4.98</td>
</tr>
<tr>
<td>Lack of alignment between retailers’ orders with suppliers’ production schedules</td>
<td>4.7</td>
</tr>
<tr>
<td>Interoperability with manual systems and e-process leading to transparency</td>
<td>4.58</td>
</tr>
<tr>
<td>Loss of direct relationship between buyer and seller</td>
<td>2.48</td>
</tr>
<tr>
<td>Implementation and integration problem</td>
<td>4.6</td>
</tr>
<tr>
<td>High initial investment</td>
<td>4.76</td>
</tr>
<tr>
<td>Cost in training employees</td>
<td>4.84</td>
</tr>
<tr>
<td>Risk of misuse of orders</td>
<td>4.76</td>
</tr>
<tr>
<td>Threats caused by hackers and business spying</td>
<td>4.68</td>
</tr>
</tbody>
</table>

Test of Hypothesis

<table>
<thead>
<tr>
<th></th>
<th>H0: Mean score = 4.5 (on a 5 point scale.)</th>
<th>H1: Mean score &lt; 4.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Score</td>
<td>4.4866667</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>0.9009028</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>SQRT of ‘n’</td>
<td>21.213203</td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>0.042469</td>
<td></td>
</tr>
<tr>
<td>Z Score</td>
<td>-0.313955</td>
<td></td>
</tr>
</tbody>
</table>

The null hypothesis is accepted with Mean score taken as 4.5, an emphatic 90 percentile.

3.13 Mobile technologies

Business expansions globally offer great advantages and opportunities, but to remain competitive, functions like mobility in supply chain management is strategic to operations. A company can effectively manage costs and risks in global supply chain with visibility of the end-to-end processes. Mobility approval process is based upon customer requirements and implemented through e-Procurement during the implementation process, ensuring the security and validity of all orders.

N. Sekar, Owner, Channel Creation felt that in the present system, supervisors are informed and seniors intervene when required. Respondents were not sure on the role of
mobile devices. But S. Chandran and Arun felt that Big-data exchange is not possible when using standalone software at the back-end.

In a legacy system, data are stored in a different standalone place. When mobility solutions are implemented, respondents were not sure about the data transfer pattern. Interoperability issues might lead to data loss.

Chart 3.5 reflects the definite need for mobility-based solutions. Though too early as a technology, line supervisors/conveyor in charge need mobile devices for regular and consistent updates. Very few felt that IoT can minimize product loss, but most of them were not aware of this new concept.

![Mobility in e-Procurement](chart)

*Chart 3.5 Need for mobility*

Table 3.3, gives the total and mean scores of factors under Role of Mobile Technologies in E- procurement. Except the factor, Employees are more productive with hand held devices, all the rest four factors are having high mean scores, each exceeding 4 points on the five point scale, the overall mean being 4.276 points.
Table 3.3 Role of Mobile Technologies in e-Procurement – Total & Mean Scores

<table>
<thead>
<tr>
<th>Mobile technologies</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>DA</th>
<th>SDA</th>
<th>TS</th>
<th>MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>All companies need mobility in solution</td>
<td>40</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>235</td>
<td>4.7</td>
</tr>
<tr>
<td>Employees are more productive with hand held devices</td>
<td>3</td>
<td>33</td>
<td>6</td>
<td>8</td>
<td>0</td>
<td>181</td>
<td>3.62</td>
</tr>
<tr>
<td>Mobile devices helps in reducing data loss and frequent updation as and when changes are made</td>
<td>20</td>
<td>27</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>214</td>
<td>4.28</td>
</tr>
<tr>
<td>Line supervisors/Conveyor in charges need mobile devices for regular updates</td>
<td>38</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>231</td>
<td>4.62</td>
</tr>
<tr>
<td>Will tracking/IoT help minimize production loss or improve lead-time?</td>
<td>21</td>
<td>18</td>
<td>9</td>
<td>2</td>
<td>0</td>
<td>208</td>
<td>4.16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>122</td>
<td>90</td>
<td>23</td>
<td>15</td>
<td>0</td>
<td>1069</td>
<td>21.38</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total</th>
<th>1069</th>
<th>Test of Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4.276</td>
<td>H0: Mean score = 4.0 (on a 5 point scale.)</td>
</tr>
<tr>
<td>SD</td>
<td>0.824</td>
<td>H1: Mean score &gt;4.0 (on a 5 point scale)</td>
</tr>
<tr>
<td>SQRT of N</td>
<td>15.81</td>
<td>The null hypothesis is rejected with Mean score &gt;4, an emphatic 80 percentile.</td>
</tr>
<tr>
<td>SE</td>
<td>0.052</td>
<td></td>
</tr>
<tr>
<td>Z Score</td>
<td>-72.43</td>
<td></td>
</tr>
</tbody>
</table>

3.14 Ways to Improve e-Procurement

Having seen the different aspects of e-Procurement, the challenges and all, means and measures of improving the same are dealt now. Making the system more user friendly, Adequate product catalogues on portals, Offering various options for billing and transactions, Reducing shipping and delivery time and Adequate information about the features of their product are certain view points developed for securing the opinion of the respondents. These are described and analyzed both in the qualitative and quantitative ways.

“Customized input screen, easy to enter data and faster data retrieval mechanism will help employees to key-in data, else, this entire process will be overlooked”, says, Mr. Venkatraman
3.14.1 User friendly

Adopting an eProcurement platform helps manage processes where users can easily learn with little or no training; gaining organization-wide adoption by making it easier for employees to order what they need and managers to review and approve requests. User interfaces with uncluttered screens and minimal input requirements can simplify the system.

Mr. Venkatraman, Senior Purchase Manager, Evolv clothing co Pvt Limited, Stalin, Purchase manager, SKL Export and many other senior experienced respondents emphasized the need for a better user interface that would be straightforward and simple; customizations based on floor operations are preferred to a standard interface.

According to Mr. Venkatraman, acceptance of e-Procurement tools amongst employees is largely dependent on simplicity of user interface.

3.14.2 Adequate product catalogues on portals

Employees need not search offline catalogues for their needs, walk around with requisitions or chase down approvals. All relevant corporate buying policies, catalogue items from preferred suppliers, other relevant punch-out suppliers and access to expert buying support will be available online. It makes it easier to find exactly user needs from authorized sources.

3.14.3 Options for billing and transactions, Reducing shipping and delivery time and Information about features of the product

In garment industry, reducing shipping and delivery time is one of the key factors. Planned ordering of goods and materials helps the company to get the required raw materials to arrive on time for manufacturing. According to Mr. Venkatraman, problem in delivery and availability are more predominant in accessories market.

To quantify the entire process, Chart 3.6 clearly highlights that user friendliness has been the most agreed point of action required for e-Procurement and was closely followed by the fact that e-Procurement could reduce the shipping and delivery time. Product catalogues and billing transactions didn’t get priority in the discussion.
Need for adequate information about features of the product did not come through as major point of discussion, as a contradictory, Chart 3.6 clearly indicates that respondents strongly believe the fact that there is clear need for e-Procurement to get information about products.

![Ways to improve e-Procurement](image)

**Chart 3.6 Ways to Improve e- procurement**

**Test of Hypothesis**

To test whether the e-Procurement has been accepted as a value chain with features of intent management, e-auctioneering, vendor management, catalogue management and contract management, test of hypothesis was done with bench mark mean score of 3.5 on a 5-point scale with the actual mean of 3.388.

<table>
<thead>
<tr>
<th>H₀: Mean score = 3.5 (on a 5 point scale.)</th>
<th>H₁: Mean score &lt;3.5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>847</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>3.388</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>1.2375711</td>
</tr>
<tr>
<td><strong>SQRT of N</strong></td>
<td>15.811388</td>
</tr>
</tbody>
</table>
The calculated modulus $Z$, 1.431, is less than 1.645, the critical $Z$ score at 5% significance level and the null hypothesis is accepted and the mean score of the means of improving the e-Procurement system in the garment industry could be taken as equal to 3.5 points.

There is a need for research to investigate and understand complex procurement information landscapes and to explore how procurement information is used to support strategic decision-making and operational improvement.

During secondary research and literature review the following facts were found

i. Most of the research papers relate e-Procurement with online tenders

ii. Communications that go out through the Government channel mention and relate e-Procurement to online trading

The basic need of the hour is to create awareness on e-Procurement capabilities that can do more than just helping companies with tenders.

Along with Mr. Poonusamy, most of the respondents felt it was high investment and needed time to understand the processes; how this knowledge on new trends, output from these technologies could be used for decision-making. Moreover, they were not sure about the interoperability of these technologies with existing legacy or standalone e-enabled software systems. There has been a considerable surge in the demand for e-Procurement software among industries and particularly, among small and mid-sized companies.

Most of the respondents were clear about the utility of e-Procurement but failed to understand the key aspect of Cloud. The respondents doubted e-enablement would involve high Capex & Opex. Moreover, the absence of “Cloud based software/solution” during discussions was quite obvious.
Gap analysis in making e-Procurement a success

Multiple points have led to the fact that data in the e-system are not fully used for decision-making process. Need for data integration across process (as captured by researcher during the course of discussion): Garment industry purchase ladder is presented in Fig 3.5. The Fig 3.5 Clearly indicates the gap that is prevalent in the acceptance & implementation of the e-Procurement software.

![Diagram of Garment purchase ladder](image)

**Fig 3.5** Garment purchase ladder, as understood by the researcher during discussion

‘A’ is the only segment that has implemented e-Procurement required for the purchase department. Moreover, present study brings out the gaps in e-Procurement and its implementation. This is very obvious from ‘B’ that different stages are not interconnected and this leads to duplication of work and delay in production process.

**Interesting scenario of loosing business due to lack of data management:**

One of the respondents categorically explained how a company lost its business due to the time taken between sample approval and purchase of final sample. This was due to the fact
that post approval, the company had to recreate the entire documentation and then order the required goods.

This could have been avoided had the company integrated all the sections and the moment a sample was approved; the purchase department will get the required order to source the inventory.

In addition to this, the researcher also came across gaps in the e-Procurement and its implementation in a major way in terms of Data Integration & Need for BI.

There has been lack of information/awareness from the purchase departments to analyze the need for data integration across various stages of procurement. Software firms too, on its part, have either not understood the importance of the need for data integration or have deliberately avoided it in the e-Procurement software so that these individual modules can be sold to the firms separately.

Hence, this lack of data integration and Business Intelligence has projected the inability of the system to:

i. Analyze on their process and come out with better modules and solutions
ii. Link back to these data for faster implementation

Though, some of the top software firms sell these modules separately, the basic need for data integration across various stages is still a big gap. Majority of software players have still not fully exploited the benefits of cloud.