CHAPTER 1
INTRODUCTION

The textiles and clothing industry is highly oriented towards labour, raw material, product, capital and inventory. These companies have employed a wide array of technologies for enhancing the efficiency and effectiveness of different business processes. Enterprise Resource Planning (ERP) is one such technology and it has proved to be critical to the success of many companies. The Indian textile industry has a significant presence in the Indian economy as well as in the international textile economy. However, technology obsolesce is one of the major issues faced by them. The penetration of ERP in this industry is low. This research aims to investigate the motivational factors and their intervening effect that influence the driving force in ERP adoption, particularly in the knitwear garment sector of the industry. This chapter presents and the current scenario of the textile and apparel industry in the global and Indian context. The need and scope of the study are motivated by the problems faced by the industry. This leads to the research question and finally, the objectives of the study.

1.1 TEXTILES AND CLOTHING INDUSTRY

The textile and clothing industry is one of the oldest in the world. It is a global industry and constantly increasing trade flows all over the world. The high production of wool, cotton and silk all over the world for the past few years has undeniably contributed to the development of world
economy. Technopak (2010) quoted McKinsey’s report that the global textile and apparel trade is recovering after the recession of 2008-09, and is expected to reach USD 1 trillion by 2020 from the present USD 510 billion.

The Indian textile industry is one the largest and oldest sectors in the country and listed among the most important in economy in terms of output, investment and employment. The sector employs nearly 35 million people. Besides agriculture, it is the second-highest employer in the country. Its importance is underlined by the fact that it accounts for around 4% of Gross Domestic Product (GDP), 14% of industrial production, 9% of excise collections and 18% of employment in the industrial sector. The business of Indian Textile Industry during 2009 was USD 70 billion (around USD 47 billion from domestic and USD 23 billion from exports) and is expected to grow to USD 220 billion (around USD 140 billion from domestic and USD 80 billion from exports) by 2020, at a growth rate of about 11% p.a. This will increase the market share of India from the current 4.5% to 8% of the world total textile trade (Technopak 2010). It is also one of the largest contributing sectors of India’s exports worldwide and accounts for nearly 12% share of the country's total exports basket (Ministry of Textiles, GoI 2010). The export basket includes a wide range of items including cotton yarn and fabrics, man-made yarn and fabrics, wool and silk fabrics, made-ups and a variety of garments.

Ready Made Garments (RMG) is the largest export segment, accounting for a considerable 45% of the total textile exports. This segment has benefited significantly after the termination of the Multi-Fibre Arrangement in January 2005 (Dun and Bradstreet 2006). As the world’s second largest producer of textile and garments, India’s garment exports totalled USD 10.70 billion during FY 2009-10, giving an inevitable market
share of 3.2%. Countries in North and South America, EU, much of Asia and Middle East are India’s clients (AEPC 2011).

The knitwear (hoisery) is playing a pivotal role in value addition in textile sector. The knitwear products include T-Shirts, Polo Shirts, Sweat Shirts, Banians, Pyjamas, Night dresses, Jogging suits, Jerseys, Pyjamas, Sports shirts, Children wear, Gloves, Nightgowns, Tracksuits, Socks etc. Global knitwear market is likely to grow and reach USD 20.3 billion by 2015. Desire for trendy lifestyle, media awareness, and an increase in disposable incomes, have invigorated the growth of the industry. Developments in fine-gauge knitting, advanced treatments such as digital printing, glossy foil prints, inkjet printing, flocking and burnouts have heated up the market. New knitting machines have opened up possibilities for the hitherto unknown segments such as technical textile comprising products such as Fishnet, Fruit-net, Shade net and composite products. Europe and North American markets dominate the global knitwear sector with a 65% share. Asia Pacific is currently growing to be a promising market for the same (“Global knitwear market gets heated up” n.d.).

Like any other sector, Micro Small and Medium Enterprises (MSME) dominate the knitwear RMG sector. This sector is largely in the decentralised sector, primarily due to reservation of the knitting units for small-scale sector. However, garment making that was earlier reserved for only Small and Medium Enterprises (SME) was opened up only after 2000. Presently 80% of the sector operate at small, tiny and cottage levels (Verma 2000). However, in terms of export earnings RMG contributes 22% of the total export of various products from the MSME sector, which is the highest (Keshab Das 2008).
All over the world, the MSMEs have been accepted as the engine of economic growth and for promoting equitable development. The MSME Development Act 2006, defines MSMEs based on investments in plant and machinery.

For enterprises engaged in the manufacture of goods:

- **Micro** - Investment in plant and machinery less than INR 2.5 million
- **Small** - Investment in plant and machinery over INR 2.5 million but not exceeding INR 50 million
- **Medium** - Investment in plant and machinery in excess of SSI limit but less than INR 100 million

The major advantage of the sector is its employment potential at low capital cost. The labour intensity of the MSME sector is much higher than that of the large enterprises. The MSMEs constitute over 90% of total enterprises in most of the economies and are credited with generating the highest rates of employment growth and account for a major share of industrial production and exports. In India too, the MSMEs play a pivotal role in the overall industrial economy of the country. As per the available statistics (4th Census of MSME Sector 2008-09), this sector employs an estimated 65.9 million persons spread over 28.5 million enterprises. It is estimated that in terms of value, MSME sector accounts for about 45% of the manufacturing output and around 40% of the total export of the country. There are over 6000 products ranging from traditional to high-tech items, which are being manufactured by the MSMEs in India (MSME Annual Report 2010).
1.2 OPPORTUNITIES AND PROBLEMS FACED BY THE INDUSTRY

United Nations Industrial Development Organisation (UNIDO) conducted a ‘SWOT’ analysis on the units of knitwear industry through Dun and Bradstreet in 2006. A similar analysis was done by Apex Cluster Development Services (Clusterkraft 2009) in their diagnostic study of Tirupur knitwear and apparel cluster for Small Industries Development Bank of India (SIDBI) under the MSME Financing and Development Project (MSMEFDP 2009). The following are the opportunities and problems faced by the industry:

1.2.1 Strength

- The knitwear garment industry in India is predominantly cotton based. India is one of the largest producers of cotton in the world

- Abundant supply of manpower at a lower wage rates gives advantage on the manufacturing cost

- Indian garment industry is very diverse in size, manufacturing facility, type of apparels produced, quantity and quality of output, cost, and demand for fabric etc. This helps in flexibility in production of small order lots and ability to handle value additions, embellishments etc. The industry comprises of suppliers of ready-made garments for both, growing domestic market and the export markets

- The industry is self reliant with the resources and the complete operations in the supply chain available in a close network. This integration gives an advantage to consumer
The knitwear garment industry is promoted and is still growing because of the strong entrepreneurial class, who transformed from an agrarian community. The cultural and language comfort with the US and European markets, promote good business relationship. This entrepreneurial spirit helps in the progressive reforms of the industry.

1.2.2 Weakness

- Knitted garment manufacturing has remained as an extremely fragmented industry that puts constraints on the production capacity and the standards.

- Industry is still plagued with some historical regulations such as knitting units remaining under SSI domain. However, there is a little relaxation on the garment units.

- There is no trade pact membership that helps by restricting the partner countries accessing the other major markets and extending a continuous market demand.

- There is a poor work practice resulting in higher production cost even in many staple garments, inspite of low labour costs. In addition, the Indian labour laws are relatively unfavourable to the trades and there is an urgent need for labour reforms in India.

- Labour force gives low productivity compared to other competing countries.

- The textile industry has been in existence for many years. There is a technological obsolescence leading to lower
efficiencies despite the support given by the government. The technologies in fabric production and processing still have to gear up to meet the international standards

- Since there are no major brands and the knitwear garment units operate on an export market, there is a low bargaining power in a customer-ruled market

- A lack of strong linkages between the raw material supplier and the apparel manufacturer lead to export at raw material stage and uncontrolled price fluctuations

- The transaction and power cost are high

- There is too much emphasis on cotton fibre and the synthetic fibre base is not equally developed. This leads to high cotton dependence and lack of market scaling

1.2.3 Opportunity

- In the domestic market, there is a low per-capita consumption of textile products indicating significant growth potential. There is a huge change in the behaviour of the domestic market with a shift to branded readymade garments with an increased disposable income and emerging mall culture and retail expansion

- India’s global share is just 3% while China controls about 15%. In post 2005, China was expected to capture 43% of the global textile trade. There is a huge opportunity for India too for increasing its share. Buyers prefer to source from India, next to China
1.2.4 Threats

- Competition post 2005 is not just in exports, but is also within the country due to cheaper imports of goods of higher quality at lower costs. There is also a pricing pressure on the exporters from the customer driven market and the availability of competing suppliers for them.

- Standards such as Social Accountability 8000 Standard (SA 8000) and the Worldwide Responsible Apparel Production (WRAP) have resulted in increased pressure on companies for improvement of their working practices.

- Due to economic developments in India, the appreciating value of the Indian Rupee is a major concern for the exporters.

- The textile clusters have a location disadvantage because of their distance from the major ports and the long transit time to key markets.

1.3 IMPLICATION OF THE PROBLEM

Many of the Indian knitwear garment companies are export oriented. They find it easy to transact and comply with the business buyers rather than doing business in the domestic market where there is a payment problem or the company investing in promoting its own brand. When serving the export market, the companies are under tremendous pricing pressures and tighter product delivery schedules. India’s textile and clothing export, as a whole, have observed ups and downs in the recent times. It was anticipated that India with a strong supply chain linkage from fibre to garments would be a major beneficiary in the quota free regime. The
trends observed in the Indian textiles exports during the first two years of post quota period have also indicated this. However, India’s share in the global textiles and clothing exports in 2007 declined to 4% and 2.8%, respectively from 4.3% and 3.3% in 2006. Garment exports from India dropped 2.64% to USD 10.64 billion in 2009-10 compared to USD 10.93 billion in the previous financial year (AEPC 2010). The exports particularly to EU and US, which amount to 64% of the total exports, declined in 2009 with regard to India, whereas the other countries such as China, Vietnam and Bangladesh managed to register growth. Some of the reasons attributed to this decline are the increased cost of production due to the increase in the cost of raw material, power and other input costs, which have affected the profitability of textiles and garment units in India and their exports (Ministry of Textiles, GoI 2009).

The scope of market availability is huge and bridging this gap requires concrete planning and implementation (Intexfair 2008). The expectations being high and prospects bright, capitalising on the new emerging opportunities will be a challenge for textile companies. Some prerequisites to be included in the globally competing textile industry are following best global practices, adopting rapidly changing technologies and efficient processes, innovation, networking and better supply chain management and ability to link up to global value chains (Dun and Bradstreet 2006). Though there is a concern for moving forward with greater sense of urgency and purpose, the traditional structure of the industry hinders the growth of the industry. Tewari (2002) expressed the importance of paying attention on traditional sectors to make them cope with adjustments of productivity enhancing, job generating and innovative activities, rather than being defensive, zero-sum and income concentrating. In recent years, the infusion of Technology Upgradation Fund Scheme (TUFS) led
investment has given a boost to the sector. It is suggested to continue with TUFS and increase the bandwidth of the scheme by adding more industries.

1.4 ERP ADOPTION IN THE INDUSTRY

Due to the very nature of the industry, the major challenges in the textile and apparel industry are a proper inventory management, a better control and above all, a streamlined manufacturing method. In addition, this sector being labour and capital intensive, the complexities have increased progressively and to remain competitive, the adoption of ERP has become inevitable. Verma (2000) in his “Restructuring the Indian Textile Industry” puts forth his concern that the response of the industry ought to be directed to meet the challenges. The Indian textile and clothing industry is in a crisis and is pleading for reforms that goes much beyond restructuring. The reforms need to be a synergy of the stakeholders, which could be on a sustainable basis for competitive advantage. They should be able to enforce technological up-gradation in the textile-producing firms, and invite a better appreciation of the role of state-of-the-art Information Technology (IT) such as ERP. Verma (2000) also envisages that such an eventuality would occur sooner rather than later is exemplified by the development of textile-specific ERP software by Indian software companies.

Brockmann and Gronau (2009) define ERP system as a software package that contains applications for different business areas (e.g. finance, marketing, etc.), and stores and accesses information from a single database used to effectively and efficiently, plan and manage the resources of companies.

Earliest studies of ERP application and its effect on business performance in textile industry were done by Holland and Light (1999) and
Hodge (2002). Similarly, the results of the e-Business Survey 2005 indicate that, since 2003, e-business activity has increased among the large companies, while the economic crisis has hampered the innovation among small firms. There is an increasing adoption of more sophisticated solutions, particularly ERP systems, as one of the most interesting trends among this industry’s large firms. This allows them to gain competitive advantages, represented by cost savings, quick reaction to market changes and more bargaining power towards business partners and distribution (Gaboardi 2005).

Being highly process-oriented, ERP enhances the effective coordination between the units, which in turn reduces the cost and time in manufacturing, reduces operational losses to a minimum. It also renders an effective management of the supply chain, just-in-time inventory and their respective financial implications on the business. Fundamentally being data-driven at the strategic level, ERP helps to formulate effective pricing strategies, forecast revenues, manage cash flows and sales trends that provide real time scalable business metrics. At the operational level, ERP helps to monitor, control, plan, schedule and analyze the entire manufacturing process, with respect to costs. It has been proved that the implementation of ERP is the fittest means to produce the best quality product at cheaper rate by real time analysis of common operating parameters on workflows between departments.

1.4.1 Present Situation of ERP Adoption

Sector study on e-business in the textile and clothing industry highlighted a gap in Information and Communication Technology (ICT) adoption and e-business activity compared to the other manufacturing sectors. This gap was particularly relevant for micro and small firms.
Overall, digital integration of processes along the value chain was found to be quite limited in this sector, characterised by many diverse operational phases and a high frequency of supply chain operations (Gaboardi 2005).

Marchi et al. (2007) studied the innovation strategies of the North Carolina’s textile and apparel industry and their attitude towards information technologies as well as the role of institutions in shaping their competitiveness. They found that firms do not devote a significant amount of company resources to IT. In most of the companies, the IT budget was less than 1% of the company’s sales. The more complex and innovative technologies, such as customer relationship management (CRM), ERP, data warehousing and business intelligence solutions are not significantly used. The adoption of ERP was just 14.7%, which was very less compared to other manufacturing companies.

PricewaterhouseCoopers made a diagnostic study of ICT in textiles clusters for the National Manufacturing Competitiveness Council (NMCC) under ‘Project Vikas’. They found that the Tirupur knitwear garments cluster is a mature cluster and many firms have adopted IT to a great or small extent. Small firms have basic finance and accounting solutions; slightly larger firms use certain order tracking systems. Firms that operate on a bigger scale have custom-built or in-house solutions that are developed in conjunction with a third party. Only a few of the large export units, with a turnover of INR 10 billion or more, are process mature enough to use full-featured ERP software (“Tirupur Knitwear Cluster” n.d.).

1.4.2 Challenges in Adoption

The adoption of ERP in knitwear industry is mainly demand driven. Pressure from distribution and business partners along the value
chain are the main motivation. Companies are aware of the competitive advantages related to ERP, the most important of which is the possibility to gain efficiency in a very complex and fragmented organisation structure. The main barriers to the adoption of e-business in this industry are related to the negative market trends and the increasing competition, which affect the overall investment capacity at the general sector level.

In this sector particularly, small and medium-sized firms are facing difficulties with the introduction of new technologies. Many firms not only lack the financial capacity to make investments, but also the skills to introduce and manage organisational changes. Moreover, the limited degree of computerisation and the diversity of technological equipment in place are constraints for the adoption of e-business. However, the growing international competition and quick changes in market trends will eventually force companies to adopt effective solutions as a response to the new strategic challenges (Gaboardi 2005).

The main challenge of ERP adoption in the textile and apparel industry is its nature of evolution from the stages of being artisanal to industrial. Though the gradual industrialization has forced entrepreneurs to adopt methods of control over production, logistics, sales and distribution, require use of ICT in order to be competitive in terms of costs, quality and service in the world markets. Varukolu and Park-Poaps (2009) examined the status of technology adoption particularly in the knitwear garment industry in Tirupur. They studied the effect of organisational factors such as firm size, export orientation, top management’s commitment, cost of capital, technical skills and competitive advantage in adoption of various technologies used in garment industry. They have found that the firms try to respond to external
forces and the industry demands extensively, rather than considering internal managerial commitments.

1.5 INSTITUTIONAL ISOMORPHISM

Institutional theory has emerged as a powerful explanation to account for the influence of external institutions on organisational decision-making and outcomes. The mechanism of decision making in adopting various technologies and practices can be well explained by this theory. Institutional theory focuses on the deeper and more resilient aspects of social structure. It considers the processes by which structures, including schemas, rules, norms and routines, become established as authoritative guidelines for social behaviour. Different components of institutional theory explain how these elements are created, diffused, adopted and adapted over space and time; and how they fall into decline and disuse.

There are two types of isomorphism: competitive and institutional. Organisations compete not just for resources and customers, but also for political power and institutional legitimacy, for social as well as economic fitness. DiMaggio and Powell (1983) while questioning the homogeneity of organisational forms and practice in the organisational field, proposed the term Institutional Isomorphism. Referring to institutional theory, they asserted that in order for organisations to survive, rules and belief systems prevailing in the environment must be considered when strategizing.

Institutional isomorphism is a “constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions”. Organisational structure, which used to emerge from the rules of efficiency in the marketplace, now rises from the
institutional constraints imposed by the state and the professions. The efforts to achieve rationality with uncertainty and constraint, lead to homogeneity of structure.

DiMaggio and Powell (1983) identified three mechanisms through which institutional isomorphic change occurs, each with its own antecedents: coercive, mimetic and normative. Liang et al. (2007) quoted DiMaggio and Powell, and described coercive pressure as “the formal and external pressures exerted upon them by other organisations upon which they are dependent, and the cultural expectations in the society within which the organisations function”. Coercive pressure is identified as the regulations from the local government, the industry associations and as a solution because of the competitive conditions. Benders et al. (2006), in their study found additional factors such as the customer/buyers and suppliers of the firm forcing them to adopt similar technologies for a smooth coordination. They may specify the adoption of certain technology as a minimum prerequisite for transaction.

Mimetic isomorphism arises when organisations face uncertainty or the goals are ambiguous or the technologies are difficult to understand. They respond to the situation by just mimicking actions of other organisations that are perceived to be legitimate or successful. Mimetic pressure arises when the firms look at their competitor and perceive that they have greatly benefited, looked upon as better by others in the same industry, or favourably considered by their suppliers and customers. Benders et al. (2006) included the influence of the media, consultants and experts or following of recent trend as some of the mimetic forces.
Normative isomorphism is defined as “the collective struggle of members of an occupation to define the conditions and methods of their work, to control the production of the future member professionals, and to establish a cognitive base and legitimization for their occupational autonomy” (DiMaggio and Powell 1983; Liang et al. 2007). The professionals and experts working for the firm compare the extent of use of technologies by their suppliers and customers and exert a pressure on the firm. These professionals are also influenced by the government’s encouragement in the use of technology.

1.6 PERCEIVED BENEFITS OF ERP ADOPTION

Adoption studies such as Diffusion of innovation (DoI) and Technology acceptance model (TAM) consider relative advantage or usefulness as important factor in the adoption. Markus and Tanis (2000); Hallikainen et al. (2004) and Chand et al. (2005) discussed on various benefits as the reason for ERP adoption. The metrics for measuring these benefits was framed based on its link to the strategic goals, objectives or critical success factors (Al-Mashari et al 2003). Many studies that look at the ERP benefits refers to the study of Shang and Seddon (2000) who classified ERP benefits into five groups as follows:

- **Operational**, relating to cost reduction, cycle time reduction, productivity improvement, quality improvement, and customer services improvement.

- **Managerial**, relating to better resource management, improved decision making and planning, and performance improvement.
Strategic, concerning supporting business growth, supporting business alliance, building business innovations, building cost leadership, generating product differentiation, and building external linkages.

IT infrastructure, involving building business flexibility, IT cost reduction, and increased IT infrastructure capability.

Organisational, relating to supporting organizational changes, facilitating business learning, empowering, and building common visions.

1.7 PERCEIVED CHALLENGES OF ERP ADOPTION

Chang et al. 2008, referring to the DoI theory, argued that the compatibility and complexity of ERP systems inhibit the adoption intention. TAM proposes perceived ease of use (PEOU) as one of the belief that creates the attitude towards the technology that lead to the intention to adopt. Triandis model proposed perceived complexity of the product as a factor affecting the attitude formation. This was used converse to PEOU in TAM. Similar to benefit identification, challenges are identified with its alignment to the impediment and consequences of ERP implementation, risks involved in ERP adoption etc.

Kamhawi (2008) through a review of the literature compiled a list of 27 problems commonly encountered in ERP projects. These problems have been grouped into four main categories: resources, technical, change management, and project management challenges. They found that other than the resources group, technical as well as project management and
change management groups of problems seemed to pose the same level of severity when firms engaged in ERP systems implementations.

1.8 ORGANISATIONAL COMPLEXITY

Industrial organisations face uncertainty created by consumers, suppliers, competitors and other environmental factors. To deal with this uncertainty, managers have to coordinate the resources of the organisation to produce a variety of behaviours that can cope with environmental change. Organizational Complexity is therefore the amount of information, and hence cost, needed to manage an enterprise or system (Mena 2003). ERP is targeted at the organisations to manage its resources effectively and efficiently. The value of ERP adoption depends on the need for such a system when integrated solution is required for information processing. Therefore, the need for ERP has been always discussed based on the size of the organisation and studies differently focus on large, medium and small enterprises (Van Everdingen et al., 2000).

Buonanno et al. (2005) proposed an assessment of the complexity measures based on previous works and proposed metrics essentially based on size, diversification, and divisionalization. They suggested that the organizational complexity has a mutual dependence on company size (micro, small, medium, large). Studies suggested a direct relationship between the size of organizations and the percentage of organizations where ERP has been implemented (IDC, 1999).

Buonanno et al. (2005) quoted that working on a wider market area requires the management of more differentiated legal and cultural issues, thus introducing a higher level of complexity as well as the facing of
competitive pressures characterizing the international markets. The global supply chain requires inter-organizational business systems and results in the widespread adoption of ERP solutions.

The degree of functional extension (number of activities carried out internally) refers to the degree of strategic functions directly managed within the company, which should be related to the amount of information to be managed and the need for integrated system. Similarly, the management of information flows is a crucial issue for companies with branch offices that need to be remotely controlled. The level of diversification (in terms of products, markets, technologies) introduces another level of complexity and adds to information-processing demands by increasing business-unit interdependencies. Because of the greater need for co-ordination and control of activities, complex organizations will tend to adopt ERP.

1.9 NEED FOR THE STUDY

Internet is believed to put an end to the ERP bust, but it is proved wrong and survey data predicts that the ERP would rule software application for the organisations (McLean Report Research Note 2007). Initially ERP solution was developed for the big organisations and was out of reach of SMEs. It required a huge investment and time for its implementation, but brought a huge benefit to the organisation. However, the large organisations went ahead with ERP process unmindful of negative consequences and fate of SME’s remained unanswered. ERP for SME’s remained a mere dream because of its cost, time to implement, availability of right solution and difficulty in implementing business reengineering.
After saturation in the larger markets with most of Fortune 500 companies implementing ERP, vendors have switched over their focus on mid markets. Therefore, ERP, a term restricted purely to elite class, is today being talked about in SMEs. Adoption of ERP software in Asia/Pacific was estimated to continue in an environment of a slowing global economy. ERP software revenue in Asia/Pacific grew at 18.1% in 2008 (Yanna Dharmasthira 2008). ERP vendors in India are focusing on the Small and Medium Business (SMB). According to Access Markets International Partners, SMBs in India spent USD 37 million on ERP solutions in 2007 (AMI-Partners 2007). Much of the impetus for this growth comes from the small business. Industry analyst ARC Advisory pegs Indian ERP growth at a CAGR of 25.2 % for 2007-2012. This increase of interest must be met with analysis of its impetus and the market implications.

ERP system is an innovative technology, essentially a packaged software application that replaces a firm’s disparate transaction processing systems with a single, integrated system, embodying the newly understood tight interdependencies among a firm’s functional units (Ross and Vitale 2000). The fit between the ERP system and the organisation’s strategy is often ignored. Carr (2003) inquires, “Is IT irrelevant or can IT give a substantial advantage when used effectively?” The information technology is turning to be a commodity like earlier technologies such as railroads and electric power. Carr recognises that early deployment of IT will give the companies a chance to gain strong competitive advantages. However, as their availability increases and their cost decrease, they become ubiquitous and commodity inputs. From a strategic standpoint, they become invisible and no longer matter.
SMEs are important for the economic growth, employment and social development of any country. Liberalisation and de-regulation in the industry is thought to contribute for the growth of the SME sector, but they also face challenges brought about by globalisation, technological changes, the information age and the secondary treatment by various institutions. In this environment, it is important that SMEs have to be innovative and acquire necessary skills and technology to fight the challenges internally and externally. SMEs have been forced to adopt modern business practices and strategies, which provide them a cutting edge over its competitors (Kale et al. 2008). The Indian experiences on the SME and their development has shown that it requires designing of interventions targeting a cluster or may be a sector/subsector or even product specific. A “one size fits all” approach will not work. Therefore, IT managers should recognize the need for ERP and understand what is driving ERP implementation and whether it provides the appropriate solution for their type of enterprise.

The factors in adoption of innovative technologies like ERP are studied under various perspectives (Nzaou et al. 2008). The diffusion agents acting from external to the organisation that are part of the institution combine together to generate a strong isomorphic pressure that forces organisations to adopt ERP and thus comply with the institutionalised management practices (Wood and Caldas 2001). Industrial clusters are geographic concentration of interconnected companies and institutions in a particular field. Clusters by their collective strength provide competitiveness within countries as well as across national borders (Porter 1998). However, there is competition and cooperation within the units of the cluster. Porter identified that there is a sheer pressure in the form of competitive pressure and peer pressure. Competitive pressure is the rivalry to win and retain customers. Peer pressure arises when companies need to be similar in
characteristics to be a part of the cluster. This peer pressure can be identified as the institutional isomorphic pressures described by DiMaggio and Powell (1983).

On the academic front, a comprehensive literature review of the ERP research field by Schlichter and Krammergaard (2010) held the need of theoretical lens for adoption models. They suggested that the research on macro diffusion of ERP in particular industries and geographical areas are required. They conceptualise this kind of research under the market and industry, which is one of the eight areas of concern with regard to ERP. Three recent literatures can be quoted here to reiterate the need for adoption studies. Howard et al. (2010) proposed to reconceptualise the motivation in adoption and acceptance research. Oliveira and Martins (2011) are concerned about the IT adoption models at the firm level. The outcome of their study recommended that combining more than one theoretical model to achieve a better understanding of the IT adoption phenomenon. The literature by Haddara and Zach (2011) focused on the adoption of ERP in SMEs. They conducted a review of literature on ERP systems in SMEs and categorised them on the ERP life cycle stages. They identified gaps in adoption literature and set a direction for future direction.

1.10 SCOPE OF THE STUDY

Tirupur, popularly known as Knit City of India is the administrative headquarters of the Tirupur district and situated 50 kilometres East of Coimbatore, the Manchester of South India. The city municipal corporation area is spread over 27.20 square kilometres with a population of around 0.7 million. The knitting industry in Tirupur has emerged as a global supplier of premier knitwear garments, earning high
foreign exchange. Tirupur, the town of export excellence can deliver customized samples in less than 12 hours; half a million pieces in a matter of a day. The entire Tirupur cluster generates direct employment and its rapid development attracts workers from different parts of Tamilnadu and neighbouring states.

The origin of the Tirupur knitwear cluster dates back to 1920. The first export consignment was made during the year 1974. However, the momentum for export started only during the early 1990. The growth is attributed to the positive steps taken by a few visionaries who founded Tirupur Exporters’ Association (TEA) to solve the problems faced by the industry. The total value of exports from Tirupur touched INR 115 billion during the year 2010 from the modest INR 2.90 billion during the year 1990. World-renowned companies and labels like Nike, Lacoste, St. Michael, Benetton, Jockey, Kiabi, Marks & Spencer, C&A, Tape L Oiel, J.C. Penny, Gallery Lafayette, Wal-Mart, H&M, Old Navy, Quick Silver, Decathlon, Mother Care, Migros, Primark, Manor, S. Olivier, Euro Disney, Group Andre, Tom Tailor, Tommy Hilfiger, Adidas, Carrefour, La Redout, 3 Suisse, Zara, Karstadt Quelle, Monoprix, Devianne, Fila, Oxbro, Replay, Diesel, Nautica, Abacrobi & Stitch, MRK, (Jag Prakash Dar n.d.) buy from Tirupur.

Tirupur has a supplier base, which consists essentially of manufacturer who are mostly integrated forward or backward. There are a number of spinners of yarn integrating forward to set up knitting plants, textile process house and then further integrating forward to become makers of garments. In some cases, though the integration is not wholly owned by the exporter to become a vertical unit, they buy stakes or invest into a process house to become partners so as to ensure standard quality and a
preference to place their orders. Firms continuously upgrade the existing technology to the acceptable international levels because of the stringent legislations of the government for the environment controls. Therefore, the amount of investments in terms of plant and machinery, and overheads in the integrated garment industry is quite high as compared to other knitwear clusters and thus requires efficient management for timely return on investment.

Inspite of the fact that the Tirupur town is staggering under acute infrastructural shortage; the Tirupur knitwear exporters are able to make a mark in the international sourcing map of the textile industry because they work as a group and help each other for a common cause. The social commitment and the awareness of social compliance are effective. The exporters have ensured investment in wind energy, reverse osmosis ETP plants with zero effluent discharge, afforestation. They have also setup schools, day care centres, hospitals and medical centres for the benefit of the workers and their families.

1.10.1 Institutional Setup in the Cluster

The interesting fact about Tirupur cluster is that it is organised in a web of small work places through which the entire town works like a living industrial organisation (Chari 2000). Figure 1.1 presents the institutional map of Tirupur knitwear cluster.
Firms in this cluster include small, medium and large-sized firms. The main players of the knitwear and apparel cluster of Tirupur are the manufacturers of knitwear products for export and the domestic market. These manufacturers are supported by subcontractors who provide services like dyeing, bleaching, stitching, embroidery, etc. The support and ancillary players in the cluster include machinery manufacturers, machinery importers, ...
agents, accessory suppliers, yarn dealers and merchant buyers etc. The technical support institutions include government training institutes, training institutes run in collaboration with associations and private institutes for textile designing and management institutes. The financial support institutions include developmental and commercial banks that have a direct stake in the growth of the cluster. Local industry associations of knitwear manufacturers, exporters, dyers, knitters and printers also form a part of the cluster and play a major role in the development of industry (‘Cluster Ecosystem’ n.d.).

1.10.1.1 **Product or service market stakeholders**

Tirupur textile industry has units all along the value chain of knitwear starting from spinning, knitting, wet processing, printing, garment manufacturing and exports. In addition to this, there are ancillary units supplying buttons, laces, embroidery, cones and yarn processing etc. The industry has been able to book orders from all the sophisticated world market including European Union, U.S.A., Canada, Japan etc. besides increasing its export growth rate in non-quota market. The spinning mills in and around Tirupur supplement their yarn requirements by spinning good export quality yarn. The spindle capacity of these mills individually ranges from 25,000 to 150,000 spindles each. The knitting machinery now available with the suppliers can cover most of the gauges (gg) or tubular width of the fabric and fibre blends with advanced machinery or attachments to the knitting machinery from leading manufacturers of China, Japan, Europe and U.S.A.

The climatic conditions are ideally suited for the processing of fabrics. The process houses in Tirupur also have shown remarkable changes, keeping pace with the development in other sectors of the knitwear industry.
The printing techniques have advanced from table to semi-rotary and then to rotary and latest advanced machines. Various latest software packages are available with most of the leading suppliers of Tirupur like Lectra, Gerber and Tuka Tech, etc. for speedy accurate pattern making and grading, and also for efficient laying to optimize fabric consumptions. The Tirupur industry is emerging from hand cutting to CAM cutting facility to improve cutting room efficiency. In addition, the cutting room, sewing floor and garment finishing machineries are continuously being upgraded.

1.10.1.2 Capital market stakeholders

The cluster has branches of almost all the nationalized and private banks of the country. Almost every branch has the facility to deal with foreign exchange transactions. MSMEs in the industry across the value chain use the facilities offered by the banks. There are a number of Non-banking Financial Companies (NBFC) and lending institutions to provide support for purchase of vehicles and machineries on hire purchase basis.

There are as many as seventeen sub-sectoral industry associations in Tirupur. For example, the dyeing and bleaching units have their separate association. The importance of these associations can be gauged from the fact that all these bodies act as quasi-judicial institutions, which help to resolve the inter-firm and commercial disputes within the firms. Some of the associations such as Tirupur Exporters and Knitwear Manufacturers Association (TEKMA) also get the long-standing inter-firm payments cleared among the members. The South India Hosiery Manufacturers Association (SIHMA) also assists its members to get financial assistance from the banks and financial institutions. On the procedural front, assistance is also provided in getting the registration certificate of small-scale industry, code from Reserve Bank of India (RBI) and export-import license. It also
files legal suits in courts and represents on behalf of their members. Among
the associations, the most dynamic is TEA, a frontline association. The voice
of this association is heard in the corridors of power. Unlike other
associations, TEA has been spearheading investment in the infrastructure
projects, which directly act as a catalyst to aid and promote exports (Fair
Wear Foundation 2004).

1.10.1.3 Government stakeholders

The government can exert influence over the firm through
taxation, government spending, legal action, regulation and threatened
changes in the law. Various governments have an interest in the economic
performance of the cluster. As a result, the municipal corporation, district
administration, the state government and the central government often
provide incentives and infrastructure facilities to promote the business
aiming at increased business and more tax revenue. Other key government
agencies perform both regulatory and developmental activities. The South
India Textiles Research Association (SITRA), a research organisation
founded by the Ministry of Textiles, Government of India, primarily for
undertaking research activities required for the spinning and textile mills is
situated in the southern region. SITRA took some initiatives to solve the
problems faced by the processing units and treatment of effluents in Tirupur.

The Textiles Committee (TC) is an autonomous body promoted
by the Ministry of Textiles, Government of India with the objective of
monitoring and certifying the quality of the textiles and garments exported
from India. Besides providing more than 50% of the quality testing services
in the cluster, it also issues ‘Certificate of Origin’ to avail the concessional
duty by the importer in the importing countries. Over a period, it has shifted
its role from regulatory authority to developmental agency. It has taken a
number of initiatives, like motivating knitters to manufacture technical textiles, organizing exposure visit for the domestic manufacturers to market their products abroad and improve their business.

Apparel Export Promotion Council (AEPC) is an arm of the Ministry of Textiles, which has a regional office at Tirupur. The interface between AEPC and the exporters was frequent during the quota regime. However, with the dismantling of quota, the conventional role of AEPC has come down. Therefore, AEPC took the initiative to start Apparel Training and Design Centres (ADTCs) at important garment clusters all over the country.

1.10.1.4 Business development stakeholders

In order to meet the buyer’s expectations, production systems have to be improved, skills of the workforce need to be upgraded, quality control systems have to be strengthened, proper Information System (IS) should be in place to get the right information at the right time and value chain should be strong in terms of technical capability and delivery time. This requires a lot of support from the service providers who can guide and establish the system to achieve the goal. Although the cluster has a number of service providers in the functional areas to address the routine business needs like accounting, auditing, taxation, employee insurance and provident funds accounting, logistics, documentation etc., the availability of service providers in the strategic areas like productivity improvement, quality improvement, waste minimization, system implementation, design development and energy conservation are few.

Education and training institutes help the cluster by providing skilled employees at operational and managerial levels. NIFT-TEA Knitwear
Fashion Institute is the premier technical institute in the cluster, which leads to knowledge upgradation in the cluster, by providing regular diploma, certificate, graduate as well as postgraduate level courses for knitting, fashion designing, merchandising, apparel manufacturing and management. The Institute was promoted by TEA to improve the human resource skills of the cluster with the technical support from National Institute of Fashion Technology (NIFT).

SIHMA Institute of Fashion and Apparel Training were established by SIHMA in association with a Business Development Services (BDS), under the initiative of UNIDO, during their cluster development programme in 2001. The objective of initiating this institute is to provide technical inputs to upgrade the skills of the employees who are working in the industry and for those new entrants who could not afford to pay fees.

ATDC was started by AEPC, to train people at the shop-floor level. The focus of the Institute is to provide training in garment manufacturing technology. UNIDO took efforts to improve the quality and to minimize waste by bringing the benefits of statistical quality control and operation research techniques to SMEs in the cluster in association with the Indian Statistical Institute (ISI). As a result, the possibility of achieving ‘zero defect’ and doing away with the final inspection in the garment unit was demonstrated through pilot programmes.

Sardar Vallabhbhai Patel International School of Textiles and Management (SVPISTM) was started by the Ministry of Textiles, Government of India, at Coimbatore to channelize the management skills required for the textiles and the garment industry. It offers full time postgraduate programme for managing textile units.
1.10.1.5 Community and interest groups

The cluster has long been a stronghold of the workers movement, with strong unions. Central Indian Trade Union (CITU) is the main trade union in the garment sector. It is affiliated to the CPI (M). Besides the above, there are the following unions: All India Trade Union Congress (AITUC), affiliated to the CPI, The Labour Progressive Front (LPF) affiliated to the DMK, a regional party, Marumalarichi Labour Progressive Front affiliated to the (M)DMK, a regional party. Anna Labour Federation affiliated to the AIADMK, a regional party, Indian National Trade Union Congress (INTUC), affiliated to the National Congress Party, National Labour Organisation, Hind Mazdoor Sabha and some small trade unions are operating in the cluster.

A special interest group called Tirupur Steering Group (TSG) is functioning with seven major trade unions and five NGOs as its members. The NGO members are Partners in Change (PiC), Social Awareness and Voluntary Education (SAVE), Centre for Social Education and Development (CSED), Community Awareness Research Education Trust (CARE). The project seeks to bring together both the company management as well as the stakeholders like trade unions and NGOs for jointly addressing issues of common concern and work together for an agreeable and sustainable garment production and trading in Tirupur. The TSG members are regularly provided training on social and environmental issues.

1.10.2 Institutional Isomorphic Pressures in the Cluster

The performance and dynamic adaptability of a cluster largely depends upon how firms engage themselves into collective action and create a dense network of institutional norms. The SME cluster of knitwear
garments that was taken for the study has a well-developed institutional structure. Looking at the institutional structure, it can be understood that the industrial cluster can produce an isomorphic pressure on firms to be homogeneous. This isomorphic pressure forces organisations to adopt a common innovative technology such as ERP.

An exemplified institutional isomorphic pressure that the knitwear garment cluster is known to experience is the concern on labour standards. In addition to company codes of conduct, several international voluntary labour standards have made inroads into Tirupur and the most prevalent of which is SA 8000 and WRAP certification. There is no doubt that because of this external pressure, use of child labour has been totally stopped not only in exporting units, but also in the subcontracting workshops. The compliance of generic codes involves investments in additional physical infrastructures such as canteen, hostels, creche and so on as well as in detailed documentation and administrative costs.

Another institutional pressure that mainly arises from the community and interest groups that are concerned with the protection of environment is the problem of effluents. This has forced the firms towards compliance of zero discharge of effluents. The collective action such as Common Effluent Treatment Plant (CETP) has been initiated in the cluster. A similar compulsion has also sprung up in the cluster towards the use of ICT facilities. E-readiness Centre (ERC) is an impartial, institutionalized common platform for all the cluster actors to share and gain information specifically in the field of ICT and to help them in planning, adapting and managing better work practices. Another initiative, ‘Project Vikas’ provides competitiveness enhancement programmes for SME's in Indian manufacturing sector. The project aims at creating a network that will
enhance access to markets, improve skills through relevant and focused training and provide for relevant and customized ICT solutions for the manufacturing sector.

1.10.3 Use of ICT in the Cluster

In the post quota scenario, the buyers abroad have a wider range of choice. Therefore, the critical strategies for the manufacturers in the cluster for export competitiveness will be shortening lead times, reducing expensive inventories and evolving innovative ways to connect the entire value chain electronically from sourcing of fabrics and garment accessories to integrating them to final sales. This would require the SME cluster players to develop business processes to implement and manage e-technologies efficiently in order to meet this situation.

The cluster appeared more conscious in spending on ICT in monitoring the quality standards. The exporters source supplies from multi-level production centres and varied production sources. This will require quality synchronization and information sharing. While large firms in the cluster are in line with the leading international manufacturing sectors in ICT usage, most of MSME’s require strong support. The most common handicap mentioned in ICT implementation is the delay in installing the systems due to limited availability of the local software vendors, which are mostly based far away from the city. It appears that there are huge gaps in the deployment of ICT in the areas of supply chain management, designing, merchandising and customer relations. Huge amount of money is being spent only for monitoring the quality standards. Since most of the exporters have multi-level production centres and varied production sources, such quality monitoring and control can only be expected.
ICT linkages among various cluster actors are relatively not very strong. Only TEA uses ICT to communicate with its members. TEA, NIFT-TEA Knitwear Fashion Institute, ISI and the Textiles Committee have their own websites. Organisations that have national presence like ISI, the Textiles Committee use their websites for dissemination of a large portion of information about the organisations and their activities. The website of TEA is linked with the websites of its members.

The knitwear garment units mostly use legacy systems. Raw materials and finished goods are managed by some fabric procurement software, while accounting and financial management are handled by the popular accounting software “Tally”\(^1\). These applications do not have integrated solution and others cannot share the data. They also lack transparency and security. The organisations do not have a tool to track the status of the customer orders. This results in contradictions between the actual stock and the information available in the system (“Fashion Knits: Enhancing Efficiency” n.d.).

The areas in which the ICT intervention is seen to be quite useful at the Tirupur cluster are production scheduling, capacity planning, order management, costing, resource planning, skill management, sampling, production and inventory management. However, according to ‘Project Vikas’ s survey, it was found out that there were huge gaps in the use of ICT in some areas like merchandising, designing, supply chain management and customer relations (“Project Vikas” n.d.). The study also found out that the

\(^1\) Tally is a financial accounting software package designed by Tally Solutions mainly for small businesses and shops. There are over 2 million users, in over 94 countries, using Tally. Source : http://www.tallysolutions.com/website/html/aboutus/about-tally.php.
people had limited knowledge of the latest technologies like e-commerce, data warehousing etc. It was also found out that there is a limited ICT “vision” for a proper integrated business (“Weaving Success with IT Adoption” n.d.).

1.11 RESEARCH QUESTION

The use of ICT and sophisticated technology like ERP are turning into a commodity. As the prices of ERP systems fall, small companies are increasingly adopting ERP and thus receiving increased attention by those who sell and install ERP systems and as well for the researchers. However, the question is whether the same technology can provide similar competitive advantage to both the large and the small firms, or do large and small firms adopt it for different reasons? Given the differences in economies of scale, organisation structures, multiple locations etc., it is likely that small firms have different expectations about what ERP systems can do for them (Ferman 1999). However, the rate of adoption of ERP systems by SMEs has been slow because of resource scarcity, the lack of strategic planning of IS, the limited expertise in IT and the need to adopt a process-oriented view of the business (Tagliavini et al. 2002).

Knitwear garments cluster of Tirupur is responsible for 65% of India’s knitwear exports. What is interesting about Tirupur cluster that include small, medium and large-sized firms, is, that it is organized in a web of small work places through which the entire town works like a living industrial organisation (Chari 2000). Pouder and St. John (1996) viewed that geographical clusters will have different rates of adoption of innovation compared to the larger industry population. This leads to an interesting
question whether the institutional isomorphic pressures on SME garments cluster, promote ERP adoption.

Adoption of technology such as ERP involves investment of huge sum of money. Therefore, economic decision-making theories such as prospect theory and mental accounting theory will have a major role in understanding the decision making process. Mental accounting theory of Richard Thaler (1980) posits that people mentally frame assets as belonging to current income, current wealth or future income and this has implications for their behaviour. Mental accounting theory involves framing in which a person subjectively frames the utility they receive or expect and calculate the value in the transaction. Prospects theory helps in understanding the value function of a transaction.

Prospect theory is a behavioural economic theory developed by Daniel Kahneman and Amos Tversky, which describes the way people, chose between probabilistic alternatives that involve risk, where the probabilities of outcomes are known. The theory states that people make decisions based on the potential value of losses and gains rather than the final outcome, and that people evaluate these losses and gains using certain heuristics. The value function is calculated as the ratio between the benefits and the cost. Cost includes not just the monetary value of the product but also the risk involved in the transaction. The risks are barriers or challenges in the adoption decision. Therefore, this study includes perceived benefits and challenges to arrive at the value function in adoption decision.

Most of the motivation theories are base on the need theories and it can be considered a driving force for any action. Organisational complexity is found to create a need for ERP like systems to efficiently
coordinate and manage the recourses of a firm. The characteristics of SME’s create a difference in their needs and goals and they differ in many aspects to the large organisations. Though the majority of organisations in the sample cluster fall under the SME category, considering the process complexity of the garment manufacturing, the level of disintegration, the inter dependence of the organisations, and the cluster setup of the knitwear garment units at Tirupur makes it important to consider the organisational complexity in ERP adoption for this study.

Shang and Seddon (2004) proposed that the enterprise system (ES) benefits change (increase and decrease) in response to internal and external triggers, and these changes bring additional benefits and problems. Inspired by this statement, the study was proposed to test the intervening factors that probably mediate the forces towards ERP adoption. In addition, Ugrin (2009) proposed that literature on ERP adoption has overlooked an important question: When is the decision to implement a system influenced by institutional factors? This leads to the research question of this study:

- “What are the driving factors for ERP adoption in the knitwear garment industry and how do they respond to institutional isomorphic pressures?”

This study tries to address this question by empirically testing the influence of the institutional isomorphic pressures in garment cluster and how other motivational factors like awareness of benefits, awareness of challenges, complexity of their business process; respond to the institutional isomorphic pressures and influence the ERP adoption of the knitwear garment firm.
1.12 **OBJECTIVES OF THE STUDY**

The research question leads to the following objectives for the study:

1. **Primary Objective**
   - To investigate the motives that drives the ERP adoption in SME knitwear garment industry

2. **Secondary Objectives**
   - To investigate how the factors of motivation respond to the institutional isomorphic pressures
   - To investigate how factors of motivation influence the ERP adoption decision
   - To investigate how the motivational factors mediate the institutional isomorphic pressures towards ERP adoption

1.13 **STRUCTURE OF THE THESIS**

This introductory chapter has already set the broad area of the research interest and introduced the phenomenon, which leads to the study and justifies the need for research. The research problem was also identified, and a research question and the objectives of the study have been delineated.

Chapter 2 presents a theoretical background of the ERP adoption in SMEs. Initially, the literature that discuss the adoption of various technologies among the SMEs have been analysed and various theories have been compared. This leads to a possible identification of a gap in the existing
literature and directs towards a framework for the study. A conceptual model that addresses the literature gap is systematically developed. Relevant literatures on the narrow area of the concepts that are taken for research and how they are related are discussed during the model development. Propositions are then arrived at from the conceptual model and the hypotheses are developed.

In Chapter 3, the methodology of the study is described. The operational, sample, observational and statistical designs are explained in detail.

In Chapter 4, the results of data analysis are presented. First, the characteristics of the data are analysed. A confirmative factor analysis is done on the variables with latent constructs and the results are discussed on the validity of the constructs. Then the results of the inferential statistics using the path analysis are presented and the hypotheses are verified.

In Chapter 5, the results of the data analysis are interpreted and the findings of the study are discussed. By comparing the results of this study with the previous findings and the interviews with the industry experts, a practical viewpoint of the results are discussed. Implications to various stakeholders are discussed and recommendations are provided.

Chapter 6 is a summation of the thesis. The contributions of the study are highlighted. The limitations of the study are explained and a possible direction for further research is set. Other relevant details that are not included in the main part of the thesis are furnished in the appendices.