“EMPLOYMENT IN INFORMATION COMMUNICATION TECHNOLOGIES - A CASE STUDY OF THE SOFTWARE INDUSTRY AND IT ENABLED SERVICES IN KERALA”

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CERTIFICATE

Certified that this written account 'EMPLOYMENT IN INFORMATION COMMUNICATION TECHNOLOGIES - A CASE STUDY OF THE SOFTWARE INDUSTRY AND IT ENABLED SERVICES IN KERALA' Submitted for the of the degree of Doctor of Philosophy of the University of Calicut is a bonafide record of research work done by Smt. Smitha P.V, under my supervision. No part of this has been submitted earlier for any other purpose.

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DECLARATION

I, Smitha.P.V do hereby declare that this written account titled 'EMPLOYMENT IN INFORMATION COMMNICATION TECHNOLOGIES - A CASE STUDY OF THE SOFTWARE INDUSTRY AND I.T ENABLED SERVICES IN KERALA is a bonafide recode of research work done by me under the guidance of Dr. D. Prabakaran Nair, Professor in Economics, University of Calicut.

I also declare that this not been submitted by me earlier for the award of my degree, diploma, title or recognition.

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1.1 Introduction:

Information Technology(IT) or Information Communication Technology(ICT) includes computers, communication technology and the associated software. Today IT is being applied to various fields such as science, manufacturing, finance, marketing, governance etc. It has become a major engine of growth in many countries. It is expected that IT use will increase national productivity in two ways. First IT would improve labour productivity directly by substituting labour or by increasing the productivity of workers. Second, IT would increase capital productivity by complementing other investments. Thus, the IT has the ability to improve the productivity of capital and labour throughout the economy.

The importance of IT use is becoming amplified by the process of economic globalization which puts a premium on information and communications systems as the means to achieve linkages to international markets and global production networks. Therefore, governments in all countries- developed and· developing - have shown a great interest and are placing high hopes on modern IT (UNDP 1997b; World Bank 1998a). With IT we have entered a structural transition of global dimension which can be termed, the fourth logistic revolution (Anderson 1986). It is believed that revolution information would result in a paradigm shift in industrial structures and social relations, much like the industrial revolution transformed the then agrarian societies (OECD1997c). Like any other technological change, IT is also expected to increase productivity, to enhance the quality of life, to reduce prices, to create new economic activities and new employment opportunities as well as to generate wealth (Matti pohjola).

Developing countries can leverage the global revolution in ICT in two basic ways (Wong 1998a): first, as a producer or supplier of ICT goods and services to meet the rapidly growing world market demands for such goods and services; and second as a user of ICT goods and services to improve the productivity and competiveness of key sectors of their economy. Governments can become sophisticated IT users themselves. Use of IT in government facilitates an efficient, speedy and transparent process for disseminating information to the public and other agencies and for performing government administration activities. Many government bodies are now setting up web sites

where citizens can get information about services, download forms, gather data and can even communicate with officials. It ensures more transparency and promptness in the services and a space for the bureaucrats to act proactively. It can act as a big way as an antidote to redtapism.Thus new revolution in the information communication technology can act as a catalyst to the progress of a nation.

Information Technology Revolution in India

Todav, India is big in global software development and is increasingly seen as an ICT superpower with Bangalore as one of the more important centres. Four reasons are given for the development of lCT as a national strength in India: a good education system; a huge middle class with English language skills and wide opportunities to attain excellent higher education. Two of Asia's top-ten Business Administration schools are in India, in Ahmedabad and Bangalore, and five out of the ten best science and technology schools in Asia are Indian-in Mumbai, Delhi, Chennai, Kanpur and Kharagpur (Asia week, 2000). Each year about 200,000 students graduate as engineers from Indian universities (Lan-son, 2001). India has probably the largest middle class in the world, estimated at over 200 million middle class that can afford to give their children higher education and support the economic system for lCT development, as both investors and consumers.

The story of information technology revolution in India runs at many levels. Its impact on the Indian industry and the economy is dramatic. The story is even more gripping at the social level. Thousands of middle-class Indians have become wealthy because they have been part of the IT juggernaut. This has given hope to millions of others that they can change their economic and social circumstances in their own lifetimes.

Since independence, the Indian government strove to achieve autarky and the protection of Indian markets and firms from multinational competition guided nearly every policy- the information technology industries were no exceptions. For example, in the mid-1970s the Indian government demanded IBM to reduce the percentage ownership of its Indian operations to 40% but IBM refused and left India in 1978. Without doubt, the exit of IBM from India was the first major turning point for the Indian IT industry. IBM's withdrawal

released 1,200 software personnel into the Indian market, and some of these established small software houses (Lateef;1997).

The government gave the state-run Computer Maintenance Corporation "a legal monopoly to service all foreign systems" (Lateef, 1997). The vacuum created was filled up by IT companies started in India. They began manufacturing indigenous minicomputers and servicing complex machines already installed. This was followed by the advent of the PC - which drove a full decade of the 80s, rapid growth of the IT hardware industry. The protectionist policy had benefits and costs. The benefit was that it contributed to the creation of an Indian IT industry; the cost was that the industry was backward despite the excellence of its personnel. After IBM's withdrawal, there was little further interest by multinational firms in the Indian market. Due to this lack of foreign investment despite the presence of skilled Indian personnel, India was a technological backwater even while East Asia progressed rapidly.

In 1984, in response to the failure of the government-run computer firms and the success of private firms such as Wipro, HCL and Tata Consultancy Services, the Indian government began to liberalize the computer and software industry by encouraging exports (Evans, 1992). This was particularly timely because there was a worldwide shortage of software programmers. By the late 80s, multinationals were struggling to migrate their information system from mainframe to client-server configuration on the one hand and to next-generation languages on the other. This required large technical manpower and the US companies had to look outside. They had voluminous work and needed vendors who understood the work, who could wirte new codes and work with speed and cost-efficiency without compromising on quality. Indian companies provided the people, this in fact is a major turning point, which led to the creation of software services industry in the country. Indian software industry rapidly built on this entry point. In 1986, Texas Instruments received government permission to establish a 100% foreign-owned software subsidiary in India.

Connecting with this the government in1960s decided to increase its investments in education, soon attracted other foreign software engineering operations to India. Contemporaneously, entrepreneurs exploited the labour cost differential to "body-shop" Indian programmers overseas. By 1989, this accounted for a major source of

software revenues (Schware,1992). The body-shopping and the foreign owned engineering operations provided a platform through which Indian engineers could learn about the cutting-edge software techniques and developments in the West and particularly Silicon Valley. These activities created a network of contacts and an awareness of the state-of-art in global computing and software technology. The centre of this activity was the South Indian city of Bangalore (Mittal 1999).

The 'off-shore development centre' model which came up in the mid-90s was significant. This took the advantage of the cost arbitrage to another level, and was possible only because of significant improvements in the telecom infrastructure. The explosion of the Internet in the 90’s along with the immediate need of customers across the world to fix the Y2K problem took the IT industry into a different growth trajectory. The Y2K migration work became a launching-pad for several software firms from India and a growth engine for the established ones. The industry grew at around 60 per cent annually during the last 3-4 years of 90s.

One small conglomerate, Wipro, established an IT spin-off business in Bangalore in 1980 and grew to become the most highly valued Indian IT company. Another leading Indian firm was Infosys, founded in 1981. Both grew to be quite large both in terms of manpower and revenue. This is despite the fact, as Arora and Arunachalam (2000) note, that the development of globally distributed packaged software programs which is the source of the greatest profits, has not occurred. Indian software firms have an assured market for their contract programming work and therefore, little incentive to take the risk of developing software packages (Naqvi 1999).

Finally, the largest firms, perhaps due to their visibility in overseas markets through their branch offices, have leveraged their manpower resources to better advantage than small firms have, leading to an erosion in the share of small firms (Naqvi 1999). Interestingly, in contrast to Taiwan, Korea, and increasingly, China, the Indian hardware sector remains negligible, although there have been a few notable recent successes, such as Armedia and Ramp Networks.

After the rules were changed to allow foreign investment in 1985, several US high technology firms, starting with Texas Instruments and

Hewlett Packard, began outsourcing software development in India, leveraging local knowledge of English and lower labour costs. Indian firms joined them, thus beginning the development of the market for off-site contract programming. The largest Indian firms now dominate the world market in the business. The technology and economic slowdown of late 2000, triggered by the dot-com bust, and aggravated by the September 11 incidents, has been a major turning point.

The major consequences of the slowdown have been three: growth rate in IT Services business has moderated to a 30 percent range from the highs of 60-70 percent; bigger players are gaining market share and consolidation is taking place; it has made outsourcing to India more compelling for companies in US and Europe, as slowdown has forced companies to take out cost. Large IT companies like Wipro have become the logical choice for this outsourcing, and have therefore done well even in the tough global economic environment. Another turning point at the social level is the spirit of entrepreneurship that the IT industry has generated. Indians of all hues have always been terrific entrepreneurs. But before IT industry 'democratized' entrepreneurship, their forays were limited in size and ambition. The IT industry gave wings to this spirit of entrepreneurship, so that it could soar. The 'reverse brain drain' that we are now witnessing is in itself is a turning point. We were seeing a large portion of our best talent moving on to the west for higher studies and then staying on to make a career in those countries. This is happening from the 60s onwards. It's remarkable that this trend is beginning to reverse. Another most significant turning point has been the absolute recognition globally that the IT industry in India is top class.

The next is the expansion and growth of the IT -enabled services segment. The convergence of computer and telecommunications technologies is making it increasingly easy for services as well as goods to be produced in a cost effective way at a location that is distant from the market. For example, on-line interactive communication facilities between Europe and India are making it possible for European companies to outsource software service work to India, where there is an abundance of low-wage knowledge workers. The outsourcing firms benefit through lower labour costs and from access to big new markets in the fields of education and training. The

developing countries like India benefit from new jobs and novel means of education.

The Context

In general parlance, Information & Communication Technology (ICT) refers to the new digital technology increasingly being used in the present era for storing, processing and transmitting of information. It has its origin in the microelectronics revolution and has developed by the convergence of the advances in computer, communication, and satellite technologies, both hardware and software. It is regarded as a powerful tool to accelerate economic development in the modern knowledge-based society. It is a pervasive and “general-Purpose” technology (like electricity) and has impact on almost all-economic activities and other spheres of human life. To some, ICT has ushered in a post-industrial society.

In economic activities, it significantly reduces transaction costs,raises multi-factor productivity and improves organisational efficiency and thereby raises output, employment,wealth and welfare. Some studies have shown that ICT diffusion is contributing significantly to gross domestic product (GDP) of USA, and other developed countries (Pohjola 2000). The diffusion is, however,at a low level in most developing countries and hence there is the widening of the “Digital Divide”, which tends to increase the “income divide”(income inequality) between the developed and developing parts of the world. Therefore, it is considered necessary for developing countries to promote the widespread use of ICT.Further, ICT application improves the capability of developing country firms to survive in competition or grow in partnership with MNC’s in today’s globalisation era. Whatever be the reason, the developing countries have pegged high hopes on to ICT as a short cut to prosperity (UNDP 1997, World Bank, 1999).

Perhaps, there is hype about the role of ICT in solving the economic ills of the people in the developing world. For, there is no inconclusive empirical evidence on the significant productivity-enhancing power and “Verdoorn” effect of the new technology. And, the trade-off between allocating their limited investment resources on ICT or on harnessing the material-base by using conventional

technologies for resolving their problems of acute unemployment and wide spread poverty is not clear for developing countries.

Nevertheless, India has joined other developing countries in the bandwagon of ICT; the Central Government has introduced policy measures and institutional innovations to develop ICT industry, especially its software segment (Joseph and Harilal 2001). Also there have been initiatives to accelerate its diffusion in various commodity producing and service sectors (including governance) in private and public sectors. And more significantly, some states (e.g Andhra Pradesh, Karnataka, Kerala and Tamilnadu) have assigned very high priority to make use of ICT for tackling their acute problems, whether it is unemployment or poverty, of development.

In such a context, an empirical assessment of the trends in the impact study of ICT in these states assumes importance. Now, there is a growing academic and policy interest in studying the empirical relationship between new technology and employment (Viravelli, 1995). Computer Software / Services production accounts for a share of 4.33 percent in India's GDP at current prices during the year 2010-11.(Electronics and Computer Software Export Promotion Council ,Statistical Year Book , 2010-11)

In this context an assessment of the impact of Software industry and ITES on employment generation with focus on gender assumes considerable significance in Indian context today. For, the paradigm shift in India's economic policy towards liberalisation since 1991 does not appear to have resulted in any significant increase in employment generation (Goldar 2000, Gupta 2000).And discriminations based on gender and caste continue to recur even within the organized sector (Papola and Sharma 1999). In such a context the role of ICT is highly recommended in policy discussions (Vijayabhaskar 2001).

An empirical study of the employment generation of Software industry and ITES and its impact on employment is also important from academic view point as economist from the time of Ricardo have recognised the two-edged nature of technological change: it both destroys old jobs and creates new jobs. Perhaps the job creation effect of the new technology could compensate for the job destruction effect in the long run. Yet, nobody could say that the "compensation" is automatic, instantaneous or painless. At least , it creates structural

adjustment problems such as skill-base of jobs ,structure of work place , job tenure, wage structure etc. that affect the labour process and labour market particularly for women. Then it stands to reason the loss of job, “deskilling”, job fragmentation, and other restrictive features that affect women.

This is the basic question for empirical analysis in the proposed study. This theme is examined in a perspective of women’s autonomy and choices and role of specific features of institutions (e.g.family, ideology, state-policy, trade union structure etc. in distributing employment between men and women in a poor society.Here again ,it is in the form of a case study restricted to the life and work of people focusing on women in a sample of 238 employees in software industry and services units located in Techno park in Kerala.

The employment impact of ICT particularly on women is bound to be different across different societies.The choice of kerala for the case study is guided by the consideration of its differences with other southern states in some basic features.These include its relatively higher achievements in terms of human development Index(HDI)but lower percapita SDP, higher incidence of unemployment(especially educated unemployment),higher proportion of women in its population and more progressive labour market institutions ,as compared to the other south Indian states.

Objectives

The case study of the software and services industry in Kerala will be designed and implemented to meet the following broad objectives:

1. An analysis of the structure and growth of the industry in order to understand its growth dynamics and key characteristics that impact upon direct employment generation and labour markets.
2. A portrayal of the macro picture of the types of jobs, skill requirements, gender division, wage structures, and unionisation of employees.
3. A detailed exploration of the attitudes of women towards their lives and jobs, in consideration of the varied dimensions of gender embodied in female recruitment and the degree to which the character of occupations themselves contributes to continuing or change in prevailing gender stereotypes.

4. An assessment of women's entry and employment in the industry, and its impact on giving them economic power, autonomy and chance to escape from the tyrannies of traditional society.

Research Methodology

As stated earlier, the objectives will be analysed in the light of the observations emerging from a case study with a focus on women and employment in the software industry of Kerala. As the required data are hard to get from secondary sources, a primary survey is essential. Of course, secondary data available in the public domain have collated and analysed to give the contour, of the macro picture. Essentially, the study, however, would be based on the data collected with the help of a structured questionnaire from a convenient sample of software and IT –enabled service units located in Techno-park in Kerala.

In such a context, an empirical assessment of the trends in the booming software industry and its impact study in terms of work and workers of the industry, It also seeks to trace the contours of its impact on an important aspect of development viz, the pattern of employment creation and labour process with focus on gender, by attempting a case study of software industry in kerala.

Research Theme

Now, there is a growing academic and policy interest in studying the empirical relationship between new technology and employment(See for a review of Literature Viravelli,1995). The assessment of the impact of ICT on employment generation with focus on gender assumes considerable policy significance in Indian context today. For, the paradigm shift in India's economic policy towards liberalisation since 1991 does not appear to have resulted in any significant increase in employment generation (Goldar 2000, Gupta 2000). And discriminations based on gender and caste continue to recur even with in the organized sector(Papola and Sharma 1999). In such a context the role of ICT is highly recommended in policy discussions (Vijayabhaskar 2001).

An empirical study of ICT and its impact on employment is also important from academic view point as economist from the time of Ricardo have recognised the two-edged nature of technological change: it both destroys old jobs and creates new jobs. Perhaps the job creation effect of technology could compensate for the job destruction effect in the long run. Yet, nobody could say that the “compensation” is automatic,instantaneous or painless.Atleast , it creates structural adjustment problems such as skill-base of jobs ,structure of work place , job tenure,wage structure etc.that affect the labour process and labour market particularly for women. However if ICT is not considered synonymous to automation , the “adjustment problem” is unlikely to be so serious as postulated for technological change in general. Then it stands to reason the loss of job, “deskilling”,job fragmentation, and other restrictive features that affect women as hypothesised in the radical feminists discussions of labour process perspective of technological change, may not be valid in the case of ICT. This is the basic question for empirical analysis in the proposed study. This theme is examined in a perspective of women’s autonomy and choices and role of specific features of institutions (e.g.family, ideology, state-policy, trade union structure etc. in distributing employment between men and women in a poor society.

Research Questions

In particular, the study places its focus on the empirical evidence to verify the types of research questions generally based with respect to new technology and women’s employment(See Mitter and Rowbotham,1995) in the context of increasing interest in the diffusion of ICT in Indian economy and society. These research questions include:

1. Is Information technology “Skill based”? Does the software industry change substantially the production processes and create more new areas for employment? And does it change job location biased in favour of urban centres?
2. Is the job structure in Software Industry getting polarised by skill, gender and class? And does this tend to a labour market of “non-bargainable” workers denied of an opportunity to join trade unions? Does the industry lead to a change in the structure of work place, increasing self employment and declining job tenure and growth of “Contingent Workers?”

3. Even if the industry heralds new and more employment opportunities, is it that women more than men fail to achieve their potential because of their lack of access to the required skills?
4. Is women's participation high in the industry as compared to other conventional professions? In what sense the labour leads to "feminisation" of work? Is there ground for the radical feminist vision of technological change as embodying male dominance and power?
5. Does ICT based Software industry and the working pattern in technologies affect men's and women's employment wages and conditions of work differently? Is it true that there is greater demand placed by ICT on the women's working and living conditions and family life?
6. Is the "Degradation of work" hypothesis postulating de-skilling of work with technological change valid in IT?
7. Can it be said that ICT has not substantially altered the traditional association of women's employment with low skill , low status and low paid work?
8. Granted that ICT implies increased job opportunities for women , does it help significantly empowering of women? Does it bring new tensions in the women worker's domestic life?
9. What challenges do women face in adjusting to the demands of ICT in their workplace, family and society and what are their responses and strategies to meet the challenges

In seeking answers to the types of research questions listed above, it is useful to distinguish between direct and indirect impact of ICT on the lines of Freeman (1995).The direct impact is on the job creation and labour process in the ICT and related insurance and service industries comprising of its hardware, software and IT-enabled products/service in the economy. The indirect impact arises from the bandwagon effects generated by the new markets and new investments as conceptualised in Schumpeter's (1939) long-wave consequent upon the diffusion of ICT in other industries and services.

Conclusion

As ICT diffusion is at a low level and the information on it is hard to get in India the proposal is to confine the study to the direct impact. Here again, it is in the form of a case study restricted to the pattern of employment and labour process with focus on women in a sample of

software and IT- enabling service units located in Techno parks in Kerala.

The employment impact of ICT particularly on women is bound to be different across different societies. The choice of Kerala for the case study is guided by the consideration of its differences with other southern states in some basic features. These include its relatively higher achievements in terms of human development Index (HDI) but lower percapita SDP, higher incidence of unemployment (especially educated unemployment),higher proportion of women in its population and more progressive labour market institutions ,as compared to the other south Indian states.

Chapter 2
Review of Literature

2.1 Introduction

The study basically focuses on how women's entry and existence in the software industry is happened in Kerala, being a highly literate state with progressive attitudes. So it is ideal to look at how the women and labour market studies in India have dealt with and then move on to the concept of gender and later in general ICT related studies, Software industry and ITES studies have reviewed to set a background of the present study.

2.2 Women and Labour Market: Some Macro Economic Studies.

The literature on women's studies in recent years has been showing a boom as it attracted much attention by focusing Women's role as economic agents. Consequently, the entry and participation of women in the labour market has been a major concern in labour economic research. Both at the theoretical and empirical level the central issue of female labour force participation has been a recurring theme in research on labour at the national and international context.

In 1980's Women's employment as an area of research assumed prominence in India. This was the outcome of a growing realization of the increased entry of women into the labour market. Mainly, three main issues, the level of participation, occupational segmentation and wage differentials are mostly the focus of the studies in the Indian context. From one period to another the fact is that the economic role of women has changed enormously from one region or industry to another, as well as different points in family life cycle.

2.3 Theoretical and Empirical Studies on Women and Labour Market

Women labour as an important and influential variable in the labour market is of recent origin. From the late 1960's onwards the interest in gender analysis can be traced, which arose as an academic response to the second wave of feminism. Women's role as economic agents has attracted much attention during this period and studies had come up not only in the field of economics but also in disciplines like sociology, anthropology, history and so on.

Mainly three issues have been the focus of most of the theoretical and empirical studies on women and labour market studies:

- Labour market participation
- Occupational segregation
- Pay differentials.

The analytical approaches to the studies on women and labour market can be classified into three broad categories:

1. The feminism perspective (the theory of patriarchy and the resultant historical contingency and the domestic labour debate)
2. The Marxian framework (the concept of reserve army of labour and the issue of skilling and deskilling through technological change and the related gendering of jobs)
3. The neoclassical perspective (human capital theory, the price and income effect, overcrowding hypothesis).

2.4 Theory of Patriarchy

The theory of patriarchy, based on male dominance was the first in realizing and exposing the gender biased theories of social sciences. Patriarchy came up as a strong analytical response to the wave of feminism in 1960s by highlighting the neglect of women and the prominence of male oriented models in all social sciences. Patriarchy helped in exposing the existing theories as well as maintained the position of women in the labour market which is governed by the forces of patriarchy, the theory of male dominance.

The theory of capitalist patriarchy assumes that patriarchy exists side by side with capitalism with one conditioning the other. The theory of patriarchy was successful in exposing the male bias of the existing theories and also in bringing out the primacy of gender relations.

2.5 Sexual Division of labour

Patriarchy received attention, almost during the same period when domestic labour and the sexual division of labour emerged as a separate analytical framework for dealing with women's oppression in the labour market. The theory argues that women are exploited by men in the household as capitalists exploit labour (male). To make it more clear it can be explain by drawing an analogy between class-

conflict and man-woman relationship. Housework is thus seen as the major source of exploitation of women. The sexual division of labour within the household is assumed to extend beyond, to the market, leading to discrimination in the workplace too. This results in the double exploitation of women both within the household and in the market place.

2.6 Women in economics

The main stream or dominant paradigm in Economics is neoclassical economic thought. Market forms the conceptual basis of economics and is based on the premise of rationality and similarity. The differences among individuals in the form of sex, caste, religion, nationality are regarded as natural or non-competing group in the theory of rational man.

Till recently, neo classical models of labour market were largely silent on the gender implications in the labour market and paid no attention to women labour. Gender, as an analytical category has been incorporated to the theory of economics much later.

Labour market analysis, labour force participation and labour market segregation, is based on the theory of supply and demand.Occupational segmentation in the labour market is viewed in the neo classical theory as an extension of the biological division of labour. Men due to their early entry into the labour market have access to specialized skills and are able to accumulate greater returns to investment in the education and training. In the initial level the marginal differences of skills are subsequently compounded and results in the segregation of women workers in less specialized, skilled jobs.

Using the neo classical framework, a number of hypotheses have been put forth to explain the labour market discrimination. Of these, the most important is what is called as the **‘overcrowding hypothesis.’** This hypothesis states that, there is a relatively lower demand for low skilled workers, who are more supply. This results in low wages and poor working conditions for these jobs. According to Millicent Fawcett who was the first advocate of this hypothesis, trade unions rules, employer’s rules, and employer’s prejudices and social customs deny skilled occupations to women. This leads to an

overcrowding of women in unskilled occupations, which reduces their general wages.

Yet another important development within the neo-classical economics, the human capital approach, is based on the assumption of non-substitutability of men and women. In this model segregation, wage differentials or pay relatives are perceived as the effect of variables such as differences in human capital, stability and commitment to work, as captured by productivity differences. The theory that women earn less than men because their relative needs are less, since they have fewer dependents was put forth by Millcent Fawcett, F.Y. Edgeworth and P. Sargent Florence.

The domestic labour debate, which focused on the role of domestic work as the source of women's oppression also, found expression in the new neo-classical models. Paid work is thus, the focus of men's activities while women combine both unpaid domestic work and labour market activity. Thus, women are often delegated repetitive and less skilled jobs where experience, skills and efficiency requirements are less and hence payments are low.

2.7 Women in Marxian Framework.

Marxist thought sees women's economic status as a direct result of the capitalist family structure. Since the primary concern of Marxian framework was class relations, the production relations, the social, economic and historical bearing of class relations to some extent reflect gender considerations. In the Marxist perspective gender issues were considered as a part of class problems.

Later the studies were in the Marxian framework but had a feminist perspective added to it. The major studies on women and labour market are mainly based on this fusing of the theory of patriarchy and Marxist ideology.

The idea of a reserve army of labour originally developed by Marx has been picked up by many authors within the socialist-feminist framework (Beechey 1977 and 1982; Anthias, 1980; Humphires 1983).

The disadvantaged position of women in the labour market (patriarchal theory) has led to the identification of women as reserve army of labour automatically. Women labour thus, were identified as

the most volatile part of the labour force that will be thrown out or absorbed depending upon the conditions of the business cycle.

Within the Marxist framework, the most important contribution to the theory of segmented labour market was that of Braverman. The labour process theory of Braverman (1974) is based on the Marxist framework of capitalist development. According to Braverman, skills are socially constructed, and hence gendered. In the process of capitalist development skills are reconstructed through deskilling of work as labour is being increasingly displaced by machines. The deskilling process and the fact that skills are socially determined results in the creation of hierarchy of jobs. The sexual division of labour within this hierarchy is determined by the theory of patriarchy, thus women occupy inferior positions in the labour market. Later developments in the theory of labour process (Baron 1987; Cockburn 1986 & 1988) have looked into this aspect of reskilling in women's employment. The theory of exclusion states that if there is an upgrading of work through reskilling, women are sure to be excluded unless and until males abandon these jobs. The role of trade unions, controlled and dominated by male in excluding women from skilled occupations was also brought out by these studies (Hartmann).

The theory of patriarchy and the resultant sexual division of labour have been central to the study of women and labour market. However, gender dimensions are added to these paradigms as explanations to women's issues in the labour market.

2.8 The Indian Studies on Women and Labour market.

In India, studies on women and labour market do not have a long history. The interest in women studies in India can be traced back to late 1970s, which was more or less as a response to the Census Report of 1971 and the report of the Committee on the Status of Women in India in 1975. The studies during this period were largely centered on the results of the Census and the status report based on women in rural areas. These studies (Bardhan, 1978; Mazumdar, Sharma & Acahrya 1978; Parthasarthy & Rao 1980) have gone largely to hypothesize, as well as investigate the causes of the growing gender imbalances in the form of women's invisibility in work participation and discrimination, which opened up the issue of women and labour market as an area of research.

Three contrasting hypotheses, 'feminisation', 'marginalisation' and 'stagnation' have been developed and the debate has been the subject matter of most writings in recent years. The trend towards feminization of work was attributed mainly to the changes in the macroeconomic policies during 1980s and 1990s. As Ghosh (1996) argues:

"In most developing countries across the globe, the period since 1980 has been notable for the increasing participation of women in recognized paid employment, and this trend has further intensified since 1990."

"This wide spread pattern of feminization of work, is essentially related to certain macro economic trends in operation in different ways in these countries. The extent and trend of female labour force participation indicate greater involvement of women in recognized and remunerative employment."

These macro economic trends are classified into four: (1) increased emphasis on export production; (2) increase in the share of service sectors; (3) technological changes; and (4) structural adjustment programmes and economic policies which ensure greater labour market flexibility.

2.9 Women's Status Linked to Mode of Production.

The Marxian concepts of mode of production, reserve army of labour and labour processes were also used as important explanations to women's position in the Indian labour market. The production relations are argued to have under gone drastic changes, as a result of changes in the production process and the process of accumulation. The mode of production approach to women's employment is supportive of the marginalization hypothesis.

Kalpagam characterizes India as a labour surplus economy, with multiple forms of production ranging from artisanal production to modern factory system. Mode of production and patriarchy is seen as central in analyzing division of labour, which determines the type of labour used – female and male labour. These structures exist not in isolation but are inter linked, and they interact with one another and they have implications which affect the sexual divisions of labour;

occupations which affect the sexual division of labour; occupational segregation, job stratification and hierarchies.

The division of labour is almost an extension and modifications of the patriarchal division, and women are assigned tasks involving less skills and greater drudgery. The remnants of this social relation reinforce the notion that women should be paid a lower rate, and hence there will be substantial wage differences.

Capitalist production system uses sophisticated technology, which reorganizes labour through creating labour hierarchies and segmenting labour market. The main objective of capitalist division of labour is the maximization of surplus value, which can be achieved only through reducing the wage bill, for a given amount of value added. This requires a minimization of average wage rate and / or the aggregate amount of labour. Accordingly, capitalist reorganizes labour through job splitting, which segments the labour market on the basis of skills and payment to minimize the average wage rate. The amount of labour time used will also be reduced through labour saving technologies, better production organization and greater control and supervision of labour.

The creation of job hierarchies through job splitting is found to have important dimensions for the type of labour used. This results in a skewed distribution of jobs within the capitalist system of production.

2.10 BARGAINING HYPOTHESIS

The tools of game theory were also widely applied in analyzing women's employment in India. The two major developments within this framework are : (1) collective bargaining models; and (2) co-operative conflict models.

Collective bargaining models attributes the low status of women in the labour market mainly to the absence of organized initiative. According to this theory, the imperfections in the labour market can be overthrown through collective efforts such as unionizations. The most important proponent of bargaining model in the Indian context has been Agarwal (1996). Discrimination against women in terms of occupation and wages is seen as the result of gender divergence in the distribution of land and other productive assets. Ownership of land is argued to increase the bargaining power of women both within the

household, as well as in the labour market. This affects the women's labour market participation positively. In the labor market too, this increases the bargaining power of women.

2.11 Concept of Gender

The terms 'gender' and 'gender equity' have become a popular and indispensable part of academic discussion in recent years. Development without gender perspective is not integrated.

Excluding one gender, no real development even for the dominating gender (Macdonald et al. 1995). In the Human Development Report, 1995 gender disparity has now become an important theme and the central message is human development if not engendered is endangered.Understanding gender enables one to see how men-women relationship works in the world, how it is institutionalised, legitimated and reproduced and how gender hierarchy interacts with the other structural inequalities (Peterson and Runyen 1993).

2.12 Gender: Some Early Studies

In the editorial collective of Gender & History (1989), Justification of a gender-oriented approach to history is not simply to retrieve the variety of women's past experiences but to abolish the idea that a gender hierarchy is 'natural'. During that period, much literature and empirical studies have published, Honeyman (1989) which shows women's historical place in the labour market. Earle (1989), in one of the more impressive pieces, reveals the existence of a gender division of labour by the early eighteenth century when women's occupations paralleled those of the capitalist nineteenth century. Wright (1989), confirms the long-term continuity in the kind of work women do but implies that their position deteriorated in the nineteenth century as men monopolized a greater range of the more desirable jobs. In placing gender issues, Hart (1989) confirms that women's subordination has lain historically in the 'natural' rights of men to own women, as revealed in their control over labour, property, and children.

The great value of gender as an analytical concept is that it directs attention towards the differential effects of social and cultural

processes and interventions on women and men. Instead of looking at women in isolation it helps to taken in to account the differences between men and women visibly. The term ‘gender’ scarcely appears in the academic writings of the first half of the century. Later the notion seems to have gathered wide attention only with the introduction of the sex-gender distinction (Nagla, 2001).

Sex is biological or genetic features taken to differentiate males from females, which is determined much before the birth of the child, over which outside factors have no control and gender is the socially constructed differences in character traits and role expectations for men and women, which is totally influenced by outside factors. People translate biological sex into gender, with one set of rules for females to think, feel and behave as women and different set of rules for males to be men. Emphasis on the social structure and culture is given by parents, peers, media, literature, teachers and schooling influence gender identity formation (Chatterji 1993).

Gender is a socio-culturally constructed division between females and males, which is deeply woven into the organisation of institutions. It is not just a division, but also an asymmetry, with men having more power and status (Nagla 2001.The efforts towards women’s status in par with men are based on the recognition that gender inequality is caused by structural and institutional discrimination. Gender issues manifest themselves as a disadvantages effect on women (Macdonald et al. 1995). Therefore, gender discussions mainly focused on women. Gender is discriminated and embedded in to the history of humanity that as it is not even perceived as discrimination. Because, women have always been burdened with unpaid household work and absent from public life, this is deemed to be a natural state of affairs (Jha et al. 1998).

2.13 Concept of Gender equity and Gender Justice

Gender equity is the principle and practice of fair and equitable allocation of resources and opportunities for females and males. Development affects men and women differently and so there must be special measures to achieve equity in access to resources.

Gender justice aims at much more than mere absence of discrimination. The concept of gender justice is incorporated in the concept of social justice. It means a social order based on justice-social, economic and political-as visualized by Article 38 of the Constitution. The existence of a democratic social culture and liberal and secular polity must precede gender justice. Gender justice does not thrive in a fundamentalist regime (Sathe 1996).

Gender equity has many dimensions. Equity in the labour market affects earnings, employment, and the industrial and occupational division of labour. Equity in the social development relates to the fulfilment of such basic needs as health, education etc. Equity within the household affects women's control over resources and income and responsibilities for the work required to reproduce the household on a daily and generational basis. Although these three dimensions of gender equity are related to each other, growth patterns and government policies do not affect them in the same way (Sen 1995).

The HDR of United Nations Development Programme (UNDP) 1995 states no country has found where women and men enjoy equal rights and opportunities. At the same time harmony in diversities and complementarities are essential basic ingredients of a healthy society. But problem arises when one group is deprived of its basic privileges only because of gender over which one has no control (UNDP 1995).

The preamble of United Nations (UN) Charter reaffirms faith in fundamental human rights, in the equal rights of men and women. International Convention on Economic, Cultural and Social Rights (1966) provides equal right to all people to pursue development and prohibits discrimination on the basis of sex. Declaration on the elimination of discrimination against women expresses concern over continued existence of considerable discrimination against women (Bansal 1989).

Ever since the UN Declaration of 1975 as year of woman, momentum has been gathering all over the world demanding gender equality. The UN conferences such as the International Conference on Population and Development held in Cairo in September 1994 ; the Social Summit at Copenhagen in March, 1995 ; the Fourth World Conference on Women which was held in Beijing in September, 1995 have all proclaimed the goals of gender equality and women's rights.

These dimensions of development find international reinforcement in the series of Human Development Reports.

Governments, the world over, have sensitised to the issue of gender justice and have introduced statutory changes to achieve gender equity (Indiresan 2000). Constitution of India has laid emphasis on equality of men and women.

But, this is only one side of the coin. India is one among the largest populated third world countries where females are still at a considerable disadvantage demographically, socially, culturally and economically. Compared with the developed countries India's achievements are very low both in Gender Related Development Index (GDI) and also Gender Empowerment Measure (GEM), compared to advanced states like Canada, Norway and USA.

In India, there is a considerable difference in the level of attainments of people on various aspects of well being depending on the place of residence, the sex of person and the social group or segment of population that the person belongs to. In general most indicators show a lower level of attainment for women and for people residing in rural areas (Planning Commission 2002).

However, the State of Kerala in India shows the highest gender development index in the country. Despite having the highest literacy rate and educational achievements of women, the suicide rate among females is very high, and domestic violence committed against women is increasing every year in Kerala. Educated unemployment in Kerala is significantly high and women who find employment often face discrimination and barriers to upward mobility (Eapen, 1992). Women in general display preferences for employment in the public sector where they face less discrimination and experience greater career mobility. Female labour force participation rates in Kerala have been among the lowest in all the states in India despite the high educational attainment of women (Gulati and Rajan, 1991; Eapen, 1992; Kumar, 1992). The 1991Census ranks Kerala 22nd among all the states in India with regard to female work participation rates. Women in Kerala are also discriminated against in the labour market and are placed at the lower end of job ladders (Mitra and Singh, 2006).

An attempt to analyze the demographic, social, and cultural changes that are occurring in order to understand this apparent

paradox of high human capital attainment and high violence and suicides experienced by women in Kerala, Mitra& Singh (2007).Educated women have better labour market opportunities, higher earnings, greater decision-making power within the household, and serve as excellent role models for their children. Even with the attainment of female education and economic development, Kerala is experiencing some unique social and cultural problems that are proving to be impediments in promoting gender empowerment, (Mitra, Singh, 2007).

The work participation rates among the highly educated females with a graduate degree and above in Kerala were 37 percent in urban areas and 32 percent in rural areas. The employment rates for comparable males were 87 percent and 82 percent in urban and rural areas of Kerala in the 1990s (Kodoth and Eapen, 2005).

Unlike women in the rest of India, women in Kerala are unwilling to be employed as manual labourers and clearly display preferences for employment in white-collar jobs. This is especially true among the educated females both in urban and rural Kerala (L. Devi, 2002).

Overall, a large number of suicides among women may be caused by education- and job-related variables (Mitra, Singh, 2007). Those who are employed find it difficult to adjust to a male-dominated environment in the workplace where women are often placed in secondary positions relative to males (Eapen, 1994).

According to the Beijing Platform for Action (2002), women continue to face barriers in economic empowerment and entrepreneurship. These obstacles include discrimination in education, training, hiring, access to credit, the right to own and inherit property, and promotion for equal work. In addition they receive lower levels of pay and have greater domestic responsibilities.In many developing countries there are only a small percentage of women in management and related decision-making positions (Al-Lamki, 1999).

More women have realized they can compete with men in male-dominated fields such as banking, accounting, engineering, and medicine (Hanslin, 2004; Opeke, 2002; Al-Lamki, 1999; Okpara, 1996). Women are overcoming past misconceptions that they should not participate in decision-making or wield authority over others.

Both academicians and practitioners are concerned with methods for improving job satisfaction because greater job satisfaction equates to both a better quality of life and better physical health, and thus potentially greater performance and productivity (Cranny et al., 1992). Since, work is an important aspect of people's lives and most people spend a large part of their working lives at work, an understanding of the factors involved in job satisfaction is crucial to improving employees' performance and productivity.

While some women have made considerable individual progress both in the academic and business worlds, they remain generally disadvantaged. Although(John O.Okpara , 2006) women are not legally barred from owning land, under some traditional land tenure systems only men can own it and women can gain access to land only through marriage or family.

Feminist scholarship has pointed out women's unequal relation with technology, including ICT, as gender relations often determine the use and impact of technologies. Wajcman (1991:28), for example, argues that "though new technologies do represent a force for change ... the outcomes are constrained by the pre-existing organization of work, of which gender is an integral part". Likewise, Wambui (2002) notes that barriers to effective use of ICTs in developing countries are a microcosm of existing gender relations in societies where women are socialised towards non-technical careers and away from technical work such as software development.

Despite this gender bias in the characterisation of men's and women's work, women have not been excluded from the ICT sector. In India, Wambui (2002), women are part of the ICT workforce. Equally, research in industrialised countries has noted the feminisation of software production with a higher and increasing representation of women (Wright and Jacobs, 1994). Nonetheless, the contextual force of existing gender relations continues to exert a strong influence on the relation between women and technology in ICT-related work. The emergence and progressive reinforcement of a masculine culture in this field has been emphasised (Tierney, 1995; Wright, 1997). Studies have also found that in the software industry, women work as operators or programmers in the non-managerial group, while men are predominant in managerial positions of project leaders or departmental managers (Panteli et al, 1997).

Feminists in Western countries have explained such outcomes partly by focusing on the gendered nature of the concepts of skill and technology due to flexible specialisation, where flexibility is a process of economic restructuring driven by technological change, by increased globalisation and by growing marketisation that involves a drive towards a greater variability of skills, hours and contracts in the labour market and, in some sectors, a downward pressure on rights, wages and conditions (Cook, 2000; Walby, 2000).

Of course, there is recognition that existing gender relations do have a strong influence – under "normal" conditions women will find themselves facing barriers of unequal access to ICTs, and unequal access to the benefits of ICTs (Huyer and Sisoska, 2002). Hence, the clear guidance on good practice for ICT project interventions from the micro-level of participatory assessment of needs to the macro-level of gender-sensitised policies on infrastructure (Jorge, 2002).

The development of a global "information society" has largely been characterised by the diffusion of various information and communications technologies (ICTs). While the notion of information societies is contested, there is a clear sense of disparity between the industrialised nations, with educated populations, excellent telecommunication infrastructures and growing service sectors, and the developing countries which mainly lack these information society components (Lim, 1999; Castells, 2001). Fearful of missing out on the opportunities provided by ICTs, developing countries have therefore been adopting information society strategies, placing an emphasis on both the production side (hardware manufacture, software development, etc) and on the consumption side (e-commerce, e-government, etc) (Singall and Rogers, 2001; Heeks, 2002).

Arising from this growing use of ICTs in developing countries have come a series of studies and findings. Some have been largely optimistic and gender-neutral, seeing the contribution that ICTs can make, for example, to economic development generally or to poverty alleviation specifically (Wakelin and Shadrach 2000; Cecchini, 2002; Kenny, 2002). Other findings, though, have been more nuanced, seeing technology as socially-contextualised and thus, for example, as gendered with differential barriers to access and use of ICTs by men and women (Hafkin and Taggart, 2002; Huyer and Sikoska, 2002; Wambui, 2002). This, in turn, has led to identification of a gender

dimension to the "digital divide" and to concerns that ICTs will be applied in ways that maintain or even exacerbate existing gender inequalities (Jorge, 2002; Marcelle, 2002).

India’s position is important for two main reasons. First, because it has for many years given a significant priority to ICTs both on the production side (as seen, for instance, in the development of its software industry) and on the consumption side (with significant investments in e-government applications, and attempts to push ICTs out into rural areas) (Heeks, 1996; Bhatnagar and Schware, 2000).

Second, because application of ICTs has taken place through a variety of different models, from pure market to pure state, and from gender-blind to gender-focused (Singall and Rogers, 2001). India therefore provides a valuable source of data for other countries seeking to journey towards the "information society", and concerned about the gender consequences of this journey.

Gender and Asymmetric Work-Family Boundaries Pleck (1977) argued that gendered expectations about work and family life asymmetrically shape work/family boundaries. The practical result of this asymmetry, according to Pleck, is that men's work demands will tend to spill over into family life, whereas women's family demands will tend to spill over into the workplace. Empirical studies do not always produce findings consistent with Pleck's hypothesis (see re-views in Grzywacz & Marks, 2000; Roehling et al., 2003). There is contemporary evidence, however, that men continue to spend more time in paid work than women and that women continue to spend more time in household chores and caring for children than men, even when both spouses work (Padavic & Reskin, 2002), suggesting that the gendered role ex-pectations that shape asymmetric work/family boundaries may still be intact.

Economists have long noted that services in general are cheaper in developing countries than in developed countries. This has been attributed mainly to an abundant supply of labour – the major input in the production of services – in developing countries, leading to low wages. Since the technology for producing services does not differ significantly from one country to another, lower wages result in a lower cost of producing services in developing countries (Bhagwati, 1984).

In fact, one of the notable achievements in India during the last decade has been the emergence of an internationally competitive IT software and service sector. A number of studies have looked into different aspects of India's IT software export boom (Schware, 1987, 1992; Sen, 1995; Heeks, 1996; Kumar, 2000, 2001; Arora et al, 2001; Joseph and Harilal, 2001; Parthasarathi and Joseph, 2002; Joseph, 2002).

Apart from creating jobs for highly qualified professionals as well as ordinary college pass-outs, the rise of the software industry has provided opportunities for expanding the local base of entrepreneurship. The initial start-up costs in the sector are rather low and economies of scale are not particularly significant especially for service enterprises. Hence, the entry barriers are low. This has helped a number of technical professionals to start on their own. Many of the leading software enterprises of today were started by first generation entrepreneurs. Infosys, Satyam, Mastek, Silverline and Polaris, among numerous others, were started by software professionals and engineers with small savings and loans at very modest scales to begin with (Kumar, 2001).

At a smaller level, too, it has provided opportunities for the development of entrepreneurship among the relatively less qualified professionals as well. A study of smaller or informal sector enterprises in the software and services industry in India reveals how many rewarding entrepreneurship opportunities exist for low initial set-up costs. The rates at which even these smaller enterprises have been growing means that they do not stay small for very long (Kumar, 2000).

The rise of the software industry has also prompted a number of non-resident Indians to return to the country to start software ventures. According to some estimates, the rate of returning of professionals increased from 2 per cent in 1991 to 8 to 10 percent in the late 1990s, with several senior software professionals returning to India to set up their own companies. Apparently, in Hyderabad alone, about 100 companies have been set up by returning software professionals (Kumar, 2001).

The emergence of the country as a centre for outsourcing such a highly knowledge-intensive service as software is helping to change

the public perception of India and is focusing attention on the potential of the country in knowledge-based industries. This changing perception is helping India emerge as a destination for the global or regional research and development (R&D) centres of MNEs (see Kumar, 2003).

Although the magnitude of exports of software and services from India has grown rapidly over the past decade, the general perception is that these are exports of low-value services. That perception emanates from the fact that, in the early years, the bulk of the software export activity of Indian enterprises consisted of lending their software professionals to their clients to deliver their services “on site”. It was considered to be a rather lower level of skill intensity compared with software product designing and development and has been derisively termed “body shopping” (Heeks, 1996).

Indian software enterprises have generally focused on services that are considered to be low value-adding. Having established themselves as suppliers of these services, Indian companies are now making a conscious effort to increase exports of high-end consulting with the development of domain expertise and the export of packaged software. Infosys, for instance, is focusing on the export of end-to-end services. As Indian software enterprises establish their credentials and competence, they are consciously seeking fair value for their work. This, however, may be applicable for leading companies such as TCS, Infosys, HCL Technologies, WIPRO and Satyam Computer Services, which are providing higher-end programming solutions for their clients. Infosys has successfully renegotiated its per man-hour charges with its clients. It reportedly commands US$ 90 per hour (Kumar, 2001).

Exports by MNE affiliates accounted for 23 percent of total software and services exports in 2003-04 compared with 19 per cent in 1998-99 (see Dataquest, 2004 and Kumar, 2001 respectively).

An analysis of enterprise performance found Indian software enterprises moving up the value chain in terms of rising productivity, net export earnings, export intensity, declining unit cost of production and improving profit margins since 1997 (Kumar,2001). Another study has shown that there has been upward mobility in the competence of firms (Joseph and Abraham, 2002).

Most of the export-oriented software companies operate as “export enclaves” with little linkages with the domestic economy, if at all

(D’Costa, 2003). MNE subsidiaries in software development, in particular, derive almost all of their income from exports to their parents. Hence, hardly any vertical linkages are developed with the domestic software market or the rest of the economy. The enclave nature of the operation generates very little knowledge spill over for the domestic economy.

The employees of export-oriented firms are generally lured by foreign companies. There is considerable movement of personnel from domestic market-oriented firms to export-oriented firms or foreign subsidiaries (Kumar, 2001; Joseph and Harilal, 2001). In terms of technological complexity and sophistication, some projects in the domestic market are more advanced and challenging than export projects (Arora et al., 2000).

With the initiation of economic reforms in the early 1990s, the Finance Ministry made an assessment indicating that, apart from the general orientation of all industries towards export markets, India’s comparative advantage was in software and not in hardware. Therefore, a major thrust was consciously given to software exports. Accordingly, new policy measures have been initiated, among which are the following:(a) the removal of entry barriers against foreign companies; (b) the removal of restrictions on foreign technology transfers; (c) the participation of the private sector in policymaking; (d) provisions to finance software development through equity and venture capital; (e) measures to make available faster and cheaper data communication facilities; and (f) the reduction and rationalization of taxes, duties and tariffs (Narayanamurthy, 2000). IT did have an impact on the country in terms of export earnings and FDI inflows but did not look like giving job opportunities to millions who graduate from colleges every year and therefore in terms of impact it looked elitist (Gautam Sinha 2003).

One can see the triad of technology, globalisation and marketisation come together in the Indian context to drive on the growth in call centres and in business process outsourcing: eulogised as the epitome of innovation and flexibility, these business activities are mirrored by the stress, insecurities and vulnerabilities of the employed workers; reflected in concerns about high attrition rates and gender implications (Ramesh, 2004). Nevertheless, in general terms, relatively little has been researched or written about the specifics of

gender relations in the ICT sector in developing countries, and it is this knowledge gap that this paper partly addresses.

On the positive side, employment rates for women in the surveyed software firms (40 per cent) were high relative to software industry averages in India (20 per cent) (Bajpai and Sachs, 2000). Certainly hopes have been high that ICT projects can play an important role in reducing gender inequalities (Balakrishnan, 2002).

Now, here we focus down more tightly to look at experiences in one South Indian state – Kerala – that can be seen as a microcosm of the ICT experience in India. On the one hand, Kerala has caught on to the India's "software boom" (Dayasindhu and Pradeep, 2003), and can be investigated to see how demand for software labour has impacted women's paid employment in the mainstream ICT sector. On the other hand, Kerala has also played.

Methodology

In the study we have used various tools for analysis such has basic averages, cross tabulation, percentages, t-Test, logit model, wilcoxon – Mann Whitney Test, Regression analysis, Trend analysis, various indices, all the tools have been explained below.

Wilcoxon – Mann Whitney Test

As we are using the ranked data, it is a nonparametric alternative to ‘t’ test, to test the difference between the means of two independent samples.

The Wilcoxon rank sum test is a nonparametric test for two populations when samples are independent. If X and Y are independent samples with different sample sizes, the test statistic which rank sum returns is the rank sum of the first sample.

The Wilcoxon rank sum test is equivalent to the Mann-Whitney U-test. The Mann-Whitney U-test is a nonparametric test for equality of population medians of two independent samples X and Y.

The Mann-Whitney U-test statistic, U, is the number of times a y precedes an x in an ordered arrangement of the elements in the two independent samples X and Y. It is related to the Wilcoxon rank sum statistic in the following way: If X is a sample of size n_X, then

$$U = W - \frac{n_X\left(n_X + 1\right)}{2}.$$

z-Statistic

For large samples, ranksum uses a *z*-statistic to compute the approximate *p*-value of the test. If Xand Y are two independent samples of size n_X and n_Y, where $n_X < n_Y$ the *z*-statistic is

$$z = \frac{W - E(W)}{\sqrt{V(W)}} = \frac{W - \left[\frac{n_X n_Y + n_X(n_X+1)}{2}\right] - 0.5 * sign(W - E(W))}{\sqrt{\frac{n_X n_Y (n_X + n_Y + 1) - tiescor}{12}}},$$

χ^2 Analysis

Karl Pearson and R.A. Fisher developed the "chi-square" test.

- The chi-square test is a "goodness of fit" test: it answers the question of how well do experimental data fit expectations.

Calculate the chi square statistic χ^2 by completing the following steps:

- For each observed number in the table subtract the corresponding expected number (O — E).
- Square the difference [(O —E) ^{2}].
- Divide the squares obtained for each cell in the table by the *expected* number for that cell [(O - E) ^{2} / E].
- Sum all the values for (O - E) ^{2} / E. This is the chi square statistic.

$$\chi^2 = \sum_{i=1}^{k} \frac{\left[(O-E)^2\right]}{E}$$

where, χ^2 = chi – square

Σ = denotes summation

O = observed value

E = Expected values

- A critical factor in using the chi-square test is the "degrees of freedom", which is essentially the number of independent random variables involved.
- Critical values for chi-square are found on tables, sorted by degrees of freedom and probability levels. Use pValue.
- If the calculated chi-square value is greater than the critical value from the table, "reject the null hypothesis".
- If the value is less than the critical value, accept the null hypothesis

Log –Lin Model

$Y_t = Y_0 (1+ r)^t$

Where r is the compounded rate of growth of Y.

$\ln Y_t = \ln Y_0 + t \ln (1+r)$

$\beta_1 = \ln Y_0$

$\beta_2 = \ln (1+r)$

$\ln Y_t = \beta_1 + \beta_2 t$

$\ln Y_t = \beta_1 + \beta_2 t + U_t$

Regression Analysis on Empowerment Index.

The factors which are identified to have some sort of influence on the performance of Empowerment are,

- Gender
- Marital status
- Years of Parental education
- Income of the respondent.
- Years of education of the respondent.

Regression Analysis is done to examine the relationship that exists between the above variables and the Empowerment Index of the sample data of IT professionals.

The linear regression model assumes that there is a linear or straight line relationship between the dependent variable and each predictor.

The relationship is described in the following formula,

$$\mathbf{Yi = \beta_0 + \beta_1 X_{i1} + \ldots\ldots\ldots\ldots\ldots + \beta_p x_{iP} + e_i}$$

Where,
Y_i = the value of the i^{th} case of the dependent scale variable
P = is the number of predictors
β_j = is the value of the j^{th} co-efficient, j = 0,1,.....P.
X_{ij} = is the value of the i^{th} case of the j^{th} predictor.
e_i = is the error in the observed value for the i^{th} case

- The model is linear because increasing the value of the j^{th} predictor by 1 unit increases the value of the dependent by β_j units.
- Note that β_0 is the intercept; the model predicted the value of the dependent variable when the value of every predictor is equal to 0.
- For the purpose of testing hypothesis about the values of model parameters, the linear regression model also assumes the following.
- The error term has a normal distribution with a mean of 'zero'.
- There is no perfect correlation among the explanatory variables. Correlation between explanatory variables is known as the problem of multicollinearity.
- The variance of the error term is constant across cases and independent of the variables in the model. An error term with non-constant variance is said to hetroscedastic.
- The value of the error term for a given case is independent of the values of the variables in the model and of the values of the error term for other cases. Violation of this assumption is known as auto correlation.
- The linear model with empowerment index as the dependent variable and following independent (explanatory) variables can be specified as :

$$E_I = \beta_0 + D_1X_1 + D_2X_2 + P_E X_3 + E_RX_4 + I_RX_5 + e$$

Where, EI = Empowerment Index
X_1 = Gender (1 = Male, 0 = female)
X_2 = Marital status (1= otherwise 0 = married)
$X_{\backslash 3}$ = Years of parental education
X_4 = Years of education of the respondent
X_5 = Income of the respondent
e = error term

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Where,

Y_i = the value of the i^{th} case of the dependent scale variable

P = is the number of predictors

β_j = is the value of the j^{th} co-efficient, j = 0,1,.....P.

X_{ij} = is the value of the i^{th} case of the j^{th} predictor.

e_i = is the error in the observed value for the i^{th} case

The linear model with empowerment index as the dependent variable and following independent (explanatory) variables can be specified as :

$$\mathbf{E_I = \beta_0 + D_1X_1 + D_2X_2 + P_E X_3 + E_RX_4 + I_RX_5 + e}$$

Where, EI = Empowerment Index

X_1 = Gender (1 = Male, 0 = female)

X_2 = Marital status (1= otherwise 0 = married)

$X_{\backslash 3}$ = Years of parental education

X_4 = Years of education of the respondent

X_5 = Income of the respondent
e = error term

Two Independent Sample t- Test

- If comparing two samples in order to draw inferences about group differences in the population use two sample t-test.
- Here the test statistic is based on a theoretical sampling distribution known as **sampling distribution of the difference between two means.**
- $M_{diff} = X_1 - X_2$
- The standard deviation of such a sampling distribution is referred to as the **standard error of the difference**.
- Assumptions and Requirements for the two sample test (comparing groups means) are:
- Independent variable consists of two levels of a nominal-level variable (when there are two and only two groups).
- Dependent variable approximates interval-scale characteristics or higher.
- Normal distribution or large enough sample size to assume normality due to the central limit theorem.
- Equal variance: **assumption of the homogeneity of variance**

  $\sigma_1^{\ 2} = \sigma_1^2$

  If the two groups are independent of each other uses independent group t-test.

- Level of Significance
- α is a predetermined value

  The convention

  α = .05

  α = .01

  α = .001

- If testing for equality of means then two tailed test
- For the independent groups t-test the formula is:

$$t_c = \frac{\acute{X}_1 - \acute{X}_2}{S_{\acute{X}_1 - \acute{X}_2}}$$

- The estimated standard error of the difference is estimated on the basis of variances of the two samples (Pooled Variance t-test).

$$S^2 \text{ pooled} = \frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2-2}$$

$$S_{\bar{X}_1-\bar{X}_2} = \sqrt{S_{Pooled}^2\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}$$

Where

S^2_1= variance of Group 1
S^2_2 = variance of Group 2
n_1= number of cases in Group 1
n_2= number of cases in Group 2

- Degrees of freedom = Sample size – Number of parameters estimated
- Degrees of freedom are n1 +n2 -2 for two sample test of means because the population variance is estimated from the sample.
- If $|t_c| > |t_\alpha|$ Reject H_0
- If p value < α Reject H_0

LOGIT MODEL

The linear probability model is the linear multiple regression model

$Y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 X_{2i} + \ldots\ldots\ldots + \beta_K X_{Ki} + u_i$

where Y_i is binary $_1$ so that

$\Pr [Y = 1 / X_1, X_2 \ldots\ldots\ldots X_K] = \beta_0 + \beta_1 x_1 + \beta_2 X_2 + \ldots\ldots\ldots\ldots + \beta_K X_K$

$$¿ \frac{1}{1+e^{-(0+1\,x1\,\ldots\ldots\ldots k\,x\,k)}}$$

The regression Co-efficient β_1 is the change in the probability that $\mu = 1$ associated with a unit change in X_1, holding constant the other regressors, and so forth for $\beta_2 \ldots\ldots\ldots \beta_k$. The regression Co-efficients can be estimated by OLS and the usual OLS standard errors can be used for confidence intervals and hypothesis tests.

Various Indices

- Empowerment Index
- Decision making Index
- Health Index
- Atrocity Index
- Socio-Political Index
- Stress Index
- Job Satisfaction Index
- Work Status Index
- Quality of Life Index

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Chapter III

Structure and Growth of Indian Software Industry

Introduction

Information Technology (IT) or Information Communication Technology (ICT) includes computers, communication technology and the associated software. Today IT is being applied to various fields such as science, manufacturing, finance, marketing, governance etc. It has become a major engine of growth in many countries. It is expected that IT use will increase national productivity in two ways. First IT would improve labour productivity directly by substituting labour or by increasing the productivity of workers. Second, IT would increase capital productivity by complementing other investments. Thus, the IT has the ability to improve the productivity of capital and labour throughout the economy.

ICT- In the Context of Globalization

The importance of IT use is becoming amplified by the process of economic globalization which puts a premium on information and communications systems as the means to achieve linkages to international markets and global production networks. Therefore, governments in all countries- developed and· developing - have shown a great interest and are placing high hopes on modern IT (UNDP 1997b; World Bank 1998a). With IT we have entered a structural transition of global dimension which can be termed, the fourth logistic revolution (Anderson 1986). It is believed that information revolution would result in a paradigm shift in industrial structures and social relations, much like the industrial revolution transformed the then agrarian societies (OECD1997c). Like any other technological change, IT is also expected to increase productivity, to enhance the quality of life, to reduce prices, to create new economic activities and new employment opportunities as well as to generate wealth (Matti pohjola).

Developing countries can leverage the global revolution in lCT in two basic ways (Wong 1998a): first, as a producer or supplier of lCT goods and services to meet the rapidly growing world market demands for such goods and services; and second as a user of ICT goods and services to improve the productivity and competiveness of key sectors

of their economy. Governments can become sophisticated IT users themselves. Use of IT in government facilitates an efficient, speedy and transparent process for disseminating information to the public and other agencies and for performing government administration activities. Many government bodies are now setting up web sites where citizens can get information about services, download forms, gather data and communicate with officials.

IT Revolution in India

Today, India is big in global software development and is increasingly seen as an ICT superpower with Bangalore as one of the major centre. Four reasons are given for the development of lT as a national strength in India: a good education system; a huge middle class with English language skills. Indians do not need to go abroad to attain an excellent higher education. Two of Asia's top-ten Business Administration schools are in India, in Ahmadabad and Bangalore, and five out of the ten best science and technology schools in Asia are Indian-in Mumbai, Delhi, Chennai, Kanpur and Kharagpur (Asiaweek, 2000). Each year about 300,000 students graduate as engineers from Indian universities (Lan-son, 2009).India has probably the largest middle class in the world, estimated at over 200 million-a middle class that can afford to give their children higher education and support the economic system for lCT development, as both investors and consumers.

The story of information technology revolution in India runs at many levels. Its impact on the Indian industry and the economy is dramatic. The story is even more gripping at the social level. Thousands of middle-class Indians have become wealthy because they have been in the first generation racers. This has given hope to millions of others that they can change their economic and social circumstances in their own life times.

Since independence, the Indian government strove to achieve autonomy and protection of Indian markets and firms from multinational competition the information technology industries were no exceptions. For example, in the mid-1970s the Indian government demanded IBM to reduce the percentage ownership of its Indian operations to 40% but IBM refused and left India in 1978. Without doubt, the exit of IBM from India was the first major turning point for the Indian IT industry. IBM's retreat released 1,200 software personnel

into the Indian market, and some of these established small software houses (Lateef,1997).The government gave the state-run Computer Maintenance Corporation "a legal monopoly to service all foreign systems" (Brunner, 1995 quoted in Lateef, 1997).

IT Hardware Industry

The vacuum created was filled up by IT companies started in India. They began manufacturing indigenous minicomputers and servicing complex machines already installed. This was followed by the advent of the Personal Computer - which drove a full decade of the 80’s rapid growth of the IT hardware industry. The protectionist policy had benefits and costs. The benefit was that it contributed to the creation of an Indian IT industry; the cost was that the industry was backward with no exposure. After IBM's withdrawal, there was little further interest by multinational firms in the Indian market. Due to this lack of foreign investment and despite the presence of skilled Indian personnel, India was technological backward even while East Asia progressed rapidly.

Liberalization Policy in Computers and Software Industry

In 1984, in response to the failure of the government-run computer firms and the success of private firms such as Wipro, HCL and Tata Consultancy Services, Indian government began to liberalize the computer and software industry by encouraging exports (Evans,1992). This was particularly timely because there was a worldwide shortage of software programmers. By the late 80s, multinationals were struggling to migrate their information system from mainframe to client-server configuration on the one hand and to next-generation language son the other. This required large technical manpower and the US companies had to look outside. They had voluminous work and needed vendors who understood the work, who could write new codes and work with speed and cost-efficiency without compromising on quality. Indian companies provided the people.

This in fact is major turning point, which led to the creation of software services industry in the country. Indian software industry rapidly built on this entry point. In 1986, Texas Instruments received government permission to establish a 100% foreign-owned software subsidiary in India. The capabilities of the Indian personnel which were due in large measure, to a wise decision in the 1960s by the government to increase its investments in education, soon attracted

other foreign software engineering operations to India. Contemporaneously, entrepreneurs exploited the labour cost differential to "body-shop" Indian programmers overseas. By 1989, this accounted for revenues from software firms. (Schware, 1992). The body-shopping and the foreign owned engineering operations provided a conducive atmosphere through which Indian engineers could learn about the cutting-edge software techniques and developments in the West and particularly Silicon Valley. These activities created a network of contacts and an awareness of the state-of-art in global computing and software technology. The centre of this activity was the South Indian city of Bangalore (Mittal 1999).

Off–Shore Development Model

The 'off-shore development centre' model which came up in the mid-90s was significant. This took the advantage of the cost arbitrage to another level, and was possible only because of significant improvements in the telecom infrastructure. The explosion of the Internet in the 90s along with the immediate need of customers across the world to fix the Y2K problem took the IT industry into a different growth trajectory. The Y2K migration work became a launching-pad for several software firms from India and a growth engine for the established ones. The industry grew at around 60 per cent annually during the last 3-4 years of 90s.

One small conglomerate, Wipro, established an IT spin-off business in Bangalore in 1980 and grew to become the most highly valued Indian IT company. Another leading Indian firm was Infosys, founded in 1981. Both grew to be quite large both in terms of manpower and revenue. They were successful on the Indian stock market in the 1990s and in the late 1990s they listed their stock on the US NASDAQ. In August 2000 it is demonstrated that firms capable of rapidly increasing in value could be fanned in India. This is despite the fact, as Arora and Arunachalam (2000) note that the development of globally distributed packaged software programs which is the source of the greatest profits, has not occurred. Indian software firms have an assured market for their contract programming work and therefore, little incentive to take the risk of developing software packages (Naqvi 1999). Finally, the largest firms, perhaps due to their visibility in overseas markets through their branch offices, have leveraged their manpower resources to better advantage than small firms have, leading to an erosion in the share of small firms (Naqvi 1999).

Interestingly, in contrast to Taiwan, Korea, and increasingly, China, the Indian hardware sector remains negligible.

The Boom of Software Industry in India

After the rules were changed to allow foreign investment in 1985, several US high technology firms, starting with Texas Instruments and Hewlett Packard, began outsourcing software development in India, leveraging local knowledge of English and lower labour costs. Indian firms joined them, thus beginning the development of the market for off-site contract programming. The largest Indian firms now dominate the world market in the business. The technology and economic slowdown of late 2000, triggered by the dot-com bust, and aggravated by the September 11 incidents, has been a major turning point.

The Birth of "Outsourcing Business"

The major consequences of the slowdown have been three: growth rate in IT Services business has moderated to a sustainable 30 percent range from the highs of 60-70 percent; bigger players are gaining market share and consolidation is taking place; it has made outsourcing to India more compelling for companies in US and Europe, as slowdown has forced companies to take out cost. Large IT companies like Wipro have become the logical choice for this outsourcing, and have therefore done well even in the tough global economic environment. This has been driven by the '*global delivery model'*, which has now been perfected. The proposition that this model offers to global customers is similar to what Toyota was offering in the US in the 80s (US auto industry)-significantly superior quality and at less cost.

Another turning point at the social level is the spirit of entrepreneurship that the IT industry has generated. Indians of all hues have always been terrific entrepreneurs. But before IT industry 'democratized' entrepreneurship, their forays were limited in size and ambition. The IT industry gave wings to this spirit of entrepreneurship. The 'reverse brain drain' that we are now witnessing is in itself a turning point. Another most significant turning point has been the absolute recognition globally that the IT industry in India is top class. In this one arena, India leads the way.

IT – Enabled Services – A new Venture

The next turning point is the expansion and growth of the IT - enabled services segment. The convergence of computer and telecommunications technologies is making it increasingly easy for services as well as goods to be produced in a cost effective way at a location that is distant from the market. For example, on-line interactive communication facilities between Europe and India are making it possible for European companies to outsource software service work to India, where there is an abundance of low-wage knowledge workers. The outsourcing firms benefit through lower labour costs and access to big new markets in the fields of education and training. The developing countries like India benefit from new jobs and novel means of education.

The IT sector in India has witnessed all kinds of booms such as mainframe, ERP, Y2K, dotcom etc. and in each of the booms the potential for large scale employment was limited. IT did have an impact on the country in terms of export earnings and FDI inflows but did not look like giving job opportunities to millions who graduate from colleges every year and therefore in terms of impact it looked elitist (Gautam Sinha 2003).

Growth of Computer Software Industry in India

India’s drive for technological modernization has led the economic planners and technocrats to place high priority on the development of the electronics industry. At the forefront of technological modernization, the electronics industry in India has rapidly expanded, with the computer software sector playing an important part in the promotion of exports. India’s rising international status in high technology was confirmed when West Germany accorded it partner status for the Hannover Fair, Ce Bit 1989, which provided a showcase for the most up to date development in telecommunications and computerization. Ambitious plans to boost software exports in the future are matched with some promising achievements by software producers. In promoting software exports, India enjoys certain key advantages giving it an edge over many other nations. Human resources are the main asset of the industry. Indian computer personnel are capable, well qualified, possesses a good command of the English language, and relatively low paid. How far India capitalizes on its comparative advantage remains to be seen. Nevertheless, the present buoyant state of the software sector,

combined with the important status it occupies within the electronics industry, demands serious attention.

Origin and Growth of Software Segment

The origin of the software sector in India during the early 1960s was connected with the introduction of commercial computers that were largely employed by the big companies able to afford the high costs of operating such technology. Though the use of computers in the following decade was still limited, a pool of skilled programmers had emerged. By the late 1970s, the spread of microcomputers in India created conditions that were conducive for the further growth of computer technology. Subsequent proliferation of computer hardware occurred simultaneously through the imports of mainframes and scientific minicomputers, and indigenous manufacturing which sometimes involved technical collaboration with foreign corporations. Current growth of computer software in India is therefore part of the broader process of the development of computer (and electronics) industry.

Over the last few years the electronics industry has expanded at a very rapid rate; the growth rates for 1985, 1986 and 1987 were 40.7 percent, 30.1 percent and 36.4 percent respectively. The seventh plan (1984-85 to 1989-90) envisaged a five-fold expansion in the value of electronics production – from US$ 1,600 million to US$ 7,700 million. By 1987-88, the value of production was US$ 4,065 million. The euphoria surrounding the growth of electronics was expressed by the chairman of the Electronics Research and Development Centre, and former electronics secretary, KPP Nambiar, who stated that "Electronics and Computer Software Industry will emerge as the single largest industry in the country having a far-reaching impact on the national economy if the present growth rate is maintained in the next decade."

Computer Software Policy

Within electronics, the computer industry has also grown rapidly at an annual compounded growth rate of 60 percent from 1984-87. During the same years the value of production rose from Rs. 920 million to Rs. 3750 million. This expansion is to some extent attributed to the new computer policy of November 1984 which liberalized the industry through a variety of measures aimed at promoting growth.

These included the removal of limits on capacity, permitting foreign participation, liberalizing imports, and the provision of incentives to the manufacturers of computer equipment and peripherals. Within a year of the release of new computer policy, computer production registered a rise of about 100 percent in physical terms and 65 percent in monetary value. At the same time, prices fell by 50 percent.

Importantly, the computer software policy of 1986 complemented the new computer policy. It is argued that software production, and particularly exports, are essential to counteract the high costs of imports triggered by liberalization and the anticipated growth of the computer industry. Since exports of computer hardware products are unlikely to compensate for the substantial inflow of imports, the onus for foreign exchange earnings is placed upon software exports.

Statistics of software exports provide encouraging trends from the mid-1970s onwards. Form only Rs. 8.50 million in 1975, the software exports leapt to Rs. 420 million in 1986. The rise in export earnings has been particularly marked since 1981 when it was just Rs. 44 million. According to an official source, exports of software from India experienced a considerable rise in the period 1984-87 as shown in Table 1.

Table 3.1

Software Exports 1984-87

YEAR	EXPORT
1984	US$ 22 million
1985	US$ 26 million
1986	US$ 38 million
1987	US$ 54 million

Source: Software development agency, department of electronics, Government of India, software India, 1988, Indo-US conference, P. 6

The rapid growth of exports from around the mid 1980s was expected to continue with an anticipated value of over US$ 100 million in 1988 and a target of US$ 250 million by 1989-90. The sectoral breakdown of electronics exports reveals that between 1983 and 1987

the value of computer software exports exceeded those of other items exported from the Domestic Tariff Area. Additionally, software exported from SEPZ in 1987 equaled Rs. 120 million.

Software – Different Segments

The software export achievements are based upon capability which extends across a wide range of activities that includes system software development, systems conversion, design and implementation of management information systems and decision support systems, telecommunications software, application software development, micro-based software, financial control and accounting systems, production management and inventory control, project feasibility studies and project monitoring systems, government information systems, computer aided design (CAD) and computer aided manufacturing (CAM), and expert systems. Areas like CAD, CAM and expert systems demand high skills input since they represent the more specialized and sophisticated branches of software. India has also successfully undertaken software assignments on turkey basis. The achievement of such relatively advanced capability is one reflection of the well qualified poor of scientific experts that is currently available in India.

Indian Advantage – Time Zone & Human Capital

It is widely recognized that India possesses a vast source of scientific personnel which can be employed at a relatively low rate of remuneration. This benefit, it is argued, assures India a comparative advantage in computer software production and exports. Whilst such expertise combined with low salaries is a distinct advantage, it cannot by itself guarantee continued expansion and technological upgrading. Other considerations too may have considerable bearing on the long-term outcome for the computer software sector in India.

Recent estimates done by AICTE, 2010 reveals that India has technical personnel numbering around 3 million and 250 million high school graduates, which on an international scale means that the country has one of the highest numbers of educated and technically skilled workers. Further, the government has launched computer course under the programmers generation of man power for computers which is being offered at nearly 250 institutions. Last year these institutes produced 8,000 graduates. Each year the government

is also introducing computer courses in around 100 institutes of higher education; and through another programme, training institutes in the private sector will gain recognition for courses information technology. Despite these efforts, personnel requirements are exceeding the current supply making it more difficult to attain the software export targets.

Trends in New Technology Employment

Ever since the Industrial Revolution there has been an ongoing debate over the impact of technology on employment. This debate continues today in what is widely recognized as the second industrial revolution – information technology. Till 1995, the scope of employment have grown multifold, the number of systems analysts grew nearly fifteen-fold (from 172 to 2526) during this period while computer programmers increased thirteen-fold (from 335 to 4353) and automatic data processing and machine operators increased ten-fold (from 1038 to 10709).

The trend towards increased employment in computer-related jobs actually masks two divisions. Firstly, jobs become differentiated between ‘high-skilled’ and ‘low-skilled’ work, that is between systems analysts, programmers and the like in the professional and technical category and automatic data processing and machine operators on the other.

Indian Software Industry in General

The Indian software industry has been characterized as low value/ low skill/ low risk/ low investment activities (Heeks 1995, 1996; Brunner 1991; Schware 1991). The vulnerability of the industry arising out of lack of diversification of exportable that is mainly constituted of services got revealed in a survey based study of the structure of the software industry. (Chakraborty et al 2001).Consolidation of gains in the export market through moving up the value chain and creating trained manpower has been pointed out (Kumar 2001), where as the structural dislocation resulting from export centric growth has also been highlighted (Joseph et al 2001). The studies have suggested the need for diffusion of IT use in domestic industries along with better infrastructure, and skilled manpower for maximizing the gains from software industry. On the other hand it highlighted the need for focusing on the varied development of domestic industries.

Recommendations of the IT-Taskforce

The IT Task force of 1998 have included many of these views, where the task force has set the vision of making India a software superpower (IT Action Plan Part I) and building strong hardware capability (IT Action Plan Part II) by 2008. “The 108 Recommendations of the IT Action Plan Part-I emphasise the policy framework required for creating an ambience for the accelerated flow of investment into the IT sector, with specific orientation towards the software industry. These policies are oriented towards the creation of appropriate investment climate while minimizing the procedural uncertainty, increasing velocity of business and growing proactive enterprising market aggressiveness. The task force advocated that the software industry and the hardware industry are two sides of the gold coin representing India emerging as a global IT superpower. The success of one, whether it is export of software or IT penetration drive for realizing IT for all, depends on the concomitant success of the other.” The concomitant growth of both hardware and software segments of the IT industry of India, is the only silent mechanism that would mutually reinforce the growth of each other.

Many of the software industries problems are actually hidden in typical technical jargons of the industry. An attempt is made to understand the software industry in terms of general economic terminologies. It is necessary for a better understanding of the software industry and also for deciphering the missing link between software and hardware segments of IT industry of India. Later the features of the product and services offered by the Indian software industry are also discussed. The close observation of the structure of the Indian software industry revealed that the structure of the industry is a direct consequence of the export centric product and services offered by the industry. Finally, the policy implications and are also detailed.

Software in Terminology of Economics

In technical terminology software is the interface between computers and human commands. Software is a programme that translates the system of human logic into a set of electromagnetic impulses. In general “the term software refers both to the instruction that direct the operation of computer equipment and the information content, or data, those computers manipulate (Schware 1992). What is

it as an economic product in terms of its uses? To attempt an answer we try to arrive at some understanding of software as a product, commodity its producers, users and uses.

Use and Users of Software

Use wise computer software can be broadly divided into two categories; system software and application software. System software is used to manage the components of computer system – for example, computer operating systems that control input and output operations (Schware 1992). In other words, system software controls the basic functions of computer. Application software is designed to apply computer power to the performance of tasks such as materials and facilities in hospitals, budget and payroll administration, computer-aided design, etc (Schware 1992).

Application software can be further divided into three broad groups. Customized software, shrink-wrapped software packages, and embedded software. Customized software is primarily application software that is used to customize the user's computer system so that it can fulfil particular user needs or functions (Kopetz, 1995). Customized software is used for data processing and interpersonal/ inter organizational communication for routine operations and management. The importance of this software has grown in banks, government services and management of large institutions that become increasingly dependent on computer-based technologies. Shrink-wrapped software packages are used on personal computers and allow the user to work independently. It addresses genuine user need, ease of use, flawless documentation to allow the user to be self-sufficient, etc (Kopetz 1995). Operating systems like windows, spread sheets like micro soft excel or lotus 1-2-3 and word- processing programmes like, MS Word, Word Perfect are some example of packaged software. Used mainly in personal computer sector, it is considered to be the driving force behind the personal computer revolution, office automation, productivity tools, and computer-aided design. Embedded software is a key element in a complex industrial product. It is increasingly being used in all aspects of existing business to improve or enhance the existing product by new functionality based on software (Kopetz 1995). This type of software is the core of industrial automation, machine tool industries, precision control systems, power generation and distribution, electronic products and telecommunications. Software in this category comes as part of capital

goods and consumer goods. Innovative use of microelectronics devices in industrial automation and industrial products has made embedded software as key to competitive advantage of the industrialized and newly industrialized countries. Generally, development and application of embedded software forms part of a company strategy for enhancing production efficiency, new product development and product differentiations.

Software Producers and Markets

Producers of software can be categories in three broad divisions

a. **Software made by users** – users themselves creates in house software development capability as a part of its business plan, to enhance its operational efficiency, and also for various control systems and optimization problems. Although for in house use, many such software have demand, depending on the success of the in house application, across production units and industries. The original developer and user of such software may find profitable business outside. There are examples where the original developer has created independent profit centers or a spin-off firm for dealing with the successful software developed for internal use.

b. **Software made by hardware makers** – here hardware means machine and not the computer hardware. Such hardware has computing system inbuilt and associated highly specialized software adds new features, efficiency, and dependability ad intelligent performance of machines – both capital goods and consumer durables. Such firms will have highly skilled hardware and software professionals capable of closely integrating software with hardware design. This is the embedded software segment described. It is to be noted that embedded software segment needs matching capabilities of both hardware and software.

c. **Software made by independent software firms** – such firms have their own projects for use specific (and not only user specific) software development. Packages for word processing, statistical exercises, account keeping, etc. are the examples of products from such projects. These firms may also work for the projects of the earlier two categories, depending on their credibility and contacts.

Now it is evident that software market can be divided into two categories.

1. **Invisible, unaccounted, inaccessible market** – the first two categories of software products create a market that is not visible because either they are developed for own use and therefore not traded in the market or they come as a part of hardware (embedded software) and therefore not separately accounted for in the market. This part of the software market being a part of the business strategy of the firms is not accessible by others.

2. **Visible open market** – the visible part of the total software market is therefore the part that comes under the services and products offered by the independent software firms, the part of the software development projects contracted out by the other two categories is accounted in the activities of the independent software firms.

The Waterfall model

The core of the software market is to be understood in terms of its development process. Widely acknowledged model of software development process is known as the Waterfall model proposed by Royce in 1970 (Arora et al 2001).

The model allows departmentalization and independent managerial control of each phase. From the first phase to the end the development moves from concept, through design, implementation, testing, installation, troubleshooting to the last phase of operation and maintenance. Each phase of development proceeds in strict order, without any overlapping or iterative steps. The value adds is typically greatest in the early stages of development – namely, requirement analysis and high-level design. Here the idea of the software is conceived and the specific requirements are analysed and designed, which requires mature and sophisticated levels of skills and experiences.

The later stages of coding and testing involve actual writing of programme and testing of its effectiveness in applications. This refers basically to the non-creative routine segments of production process and hence requires relatively lower level of skills. Initial phases of the software development process, therefore, and inside the user firms or with the highly skilled and experienced independent software firms

that can articulate the requirement and design of the software for users. These phases are part of the firm's growth strategy and constitute the inaccessible high investment/high risk and high skill activities part of the market.

Activities in the remaining part of the phases constitute the visible part of the market. These are the contractible jobs. The distinction between contractible and non-contractible software jobs in terms of skill and risk involved are pointed out, (NASSCOM-Mckinsey report 1999). Both user firms having in-house capability and independent software firms would outsource the contractible components of the software development process on least cost basis.

Outsourcing Industry

Independent software houses were born within the US computer hardware industry. The process has been accelerated by extensive software needs by the defence industry and space research. The user industries also found outsourcing more economical because of ever increasing maintenance and development cost for in-house arrangements. This forged a relationship between software user industry (mainly in the form of embedded software) and the independent software firms. There was no comparable growth of independent software firms in other industrialized countries like Japan and Germany. User industries in these countries continued their reliance on in house capabilities. It is only lately that these countries have realized the economic advantage of outsourcing software. Although the firms in these countries have strong in-house capabilities for undertaking the core activities in the software development process, the development of independent software firms in these countries are greatly constrained by the manpower that can take up the activities required at later phases of the waterfall model.

The software products and services offered by the Indian software industry.

Table 3.2

Domestic and Export Market of Indian Software (Rs. Millions)

Year	Domestic (Percent)	Exports (Percent)	Total	Percent-growth with previous

				year
1994-95	10,700 (41)	15,350 (59)	26,050	---
1995-96	16,700 (40)	25,200 (60)	41,900	62
1996-97	24,100 (38)	39,000 (62)	63,100	66.45
1997-98	35,100 (35)	65,300 (65)	100,400	63.18
1998-99	49,500 (31)	109,400 (69)	158,900	67
1999-00	67,811(29)	170,366 (72)	238,177	65

Table 3.3

Segment wise Break-up of Indian Software Activity, 1998-99

Software Activity	**Domestic Market**		**Export Market**	
	RS. Million	Percentage	Rs. Million	Percentage
Projects	14,100	28.5	39,950	36.50
Professional Services	2,500	5.0	48,300	44.15
Products and Packages	23,900	48.5	8,650	7.90
Training	2,300	4.5	1,880	1.72
Support and Maintenance	2,000	4.0	4,650	4.25
IT Enabled Services	4,700	9.5	5,970	5.48
Total	49,500	100	1,09,400	100

PRODUCT AND SERVICES OFFERED BY INDIAN SOFTWARE INDUSTRY

With a modest beginning around 1984-85, Indian software and services exports moved up to Rs. 25.2 billion (US $ 734 million) in 1995-96 and to Rs. 171.5 billion (US $ 4 billion) in 1999-2000 and exported to more than 91 countries around the world. The export

revenue has grown to US$ 6.3 billion by the end of 2001 (Financial Times, February 21, 2001). The industry has clearly emerged as a major export earner for the country, contributing 8 percent of total merchandise exports.Today IT and ITeS sectors lead the economic growth in terms of employment, export promotion, revenue generation and standards of living. As per NASSCOM data, IT/ITeS sector (excluding hardware) revenues are estimated at USD 87.6 billion in FY 2011-12; and the industry is expected to grow by 19 per cent during 2012-13.

The product profile of the industry, separately for domestic and export markets, is shown in Table 3.3 It is to be noted that 'products and packages' constitute the largest segment in the domestic market and lowest in the export market. In the domestic market this includes mainly selling imported packages in the domestic market. Indian firms in the late 1980s produced some moderately successful software products like accounting packages and word processing packages in Indian languages for the Indian markets and a few customized software packages for domestic clients.

More than four-fifths of the export earning comes from 'projects' and 'professional services.' Projects are 'contracted out' components of the major software projects undertaken by the software firms in the US. Professional services are essentially exports of manpower to fix the problems of the companies in the US. In popular jargon it is known as 'onsite service' or 'body shopping.'

If we read the product profile of the Indian software industry together with the foregoing general description of use and users of software we can see that Indian basket of products and services totally exclude the embedded software category in the initial years. The basket is mainly constituted of a few packages and customized software projects for the domestic market, and contracted out projects/ jobs from the software companies of (mainly) the US. These jobs are done either onsite, or offshore depending on the cost and availability of suitable infrastructure. In a typical year of 1998-99 the break-up of the nature of activities that generated the total revenue in the domestic and export market is shown in Table 3.4.

Table 3.4
Types of Software Services, 1998-99

Type of Services	Rs. Million	Percentage
Onsite Services	63,650	58.18

Offshore Services	37,100	33.96
Products and Packages	8,650	7.90

Referring back to the Waterfall model of software development process we can relate these activities with the bottom three boxes of activities, namely, integration and product verification, implementation and system test, operation and maintenance and revalidation. These are the contractible parts of the software development process and fall into the low value/low risk zones. The NASSCOM-Mckinsey report (1999) on Indian software industry also identifies these products as low risk/low skill activities.

Plausible reason for the absence of Indian software activities in the 'embedded software' segment was the result of limited industrial automation. India has a perennial weakness in the capital goods sector, as it is evident by high import dependence for capital goods. Application of microelectronic devices has revolutionized the operation, control and efficiency of the machines.

Indian capital goods industry has virtually remained untouched by this revolution. By the time the Indian capital goods industry mastered the designing and manufacturing of hardware components of a machine, introduction of embedded software in machines changed the capital goods industry all over the world. After considerable time and investment a few textile machine manufacturers have developed the capability of designing and manufacturing complex hardware system for yarn twisting machine only to discover that the computerized control system that has become general feature of any such machines in the world market has to be imported at a cost that does not make the venture profitable in the domestic as well as in the world market (Nath et al 1998). While the import dependence of capital goods sector continues, India becomes a major derived importer of embedded software as part of the imported capital goods.

Development of embedded software is a high investment, high risk and high skill venture. Such major ventures by Indian manufacturing industry, if not unknown, are insignificant. Are Indian software firms equipped to take up major innovations and associated high R and D costs for developing their own hi-tech core rooted in the manufacturing industry of India? Such a venture and ensuing experience not only helps high value addition to the products of Indian industries; it also creates high value market for Indian software

industry overseas. The ability of the Indian software industry to achieve this high pedestal depends on the structure of the industry that will uphold the high value/high risk activities.

Structure of Indian Software Industry during 1990's

Firstly, we are discussing the growth and structure of the industry in the initial years till 2000. The lack of initiative in the embedded software sector has had a crippling effect on the Indian software industry. The task being in low risk/low skill area, entry into the industry depended on contacts overseas (especially in the US market), which was most probably made by the NRI technologists in the US and their counterparts in India. After a few initial successes the process had spread its own effects to create the present size of the Indian software industry and associated education/training and telecommunication infrastructure. With the growth of the software industry in the US there was no dearth of 'contractible jobs.'

The main dynamics of the industry, however, has been that of a perfectly competitive market where supply is to be governed by a ruling price. Being low investment – low value – low skill jobs, it was manpower cost that determined the price of the services. And at the ruling price there was no entry barrier for any firm having any contact in the US market. The result has been a flock of firms entering the industry in the boom period, the initial years. Table 3.5 shows the entry of new firms in the industry till 2000. The expansion of the market during 1980s onward witnessed large-scale entry of new firms in software segment. New entry peaked during late 1980s and early 1990s. About 84 percent firms have entered since mid 1980s. The average age of firms is about eight years.

Table3.5
Entry of New Software Firms in the Industry

Period	No. of Firms (Per cent)
1971-1975	9 (1.88)
1976-1980	15 (3.13)
1981-1985	39 (8.14)
1986-1990	89 (18.58)
1991-1995	182 (38.00)
1996-1999	131 (27.35)
No information	5 (1.04)
Total	479 (100.00)

Note : A few firms in the business before 1971 have not been included

Source : Indian IT Software and Services Directory (1999-2000), NASSCOM.

Easy entry in the software segment is to be understood from the types of products and services being offered by the industry. Most software companies in India act as sub-contractors, executing assignments either onsite at client's premises or offshore at development centres in the country.

Onsite services abroad or manpower contracts have opened up another easy route to entry. People engaged in such contracts get exposure to hardware and software platforms, not available in India. They also get exposed to the business opportunities and trend and nature of the overseas market including valuable contacts that help in them to start their own ventures back home. Such contacts and exposures also help in striking foreign collaborations or securing agencies of foreign firms for the domestic market. Collaborations and agencies help in the accessing of new hardware and software platforms and in securing work contracts overseas. Schware (1992) observed that such firms that have also spent substantial time in the US find the most business.

Easy entry has created opportunity for small and tiny firms enter the business. Table 3.6 shows the authorized capital of the Indian software firms. It is interesting to note that more than 65 percent firms have less than Rs. 100 million authorized capital till the year 2000. Only 1.25 percent of total firms has capital base more than Rs. 1,000 million. The average authorized capital of firms is around Rs. 88.8 million.

Table 3.6 Authorised Capital wise no of Firms	
Authorised Capital (in Million)	No. of Firms (percent)
Less than 1	31 (6.47)
Less than 5	67 (13.99)
Less than 10	39 (8.14)
Less than 30	77 (16.08)
Less than 50	29 (6.05)
Less than 100	69 (14.41)
Less than 200	53 (11.06)
Less than 500	27 (5.64)
Less than 1000	11 (2.30)
More than 1000	6 (1.25)
No information	70 (14.61)
Total	479 (100)

Source: Indian IT Software and Services Directory (2001), NASSCOM.

The flow of entry of small and tiny firms has created a long structure of the industry. The structure of Indian IT industry, therefore, is not much different from the other long established Indian industries studied by Desai (1982). Table 3.7 shows annual turnover wise (which indicates size of firm) till 2000, the number of firms in software industry. In 1998-99, as shown in Table 3.8 about 60 percent of total software firms have turnover less than Rs. 150 million. Only 5 percent have turnover more than Rs. 1,000 million.

Table 3.7 Turnover wise Numbers of Firms, 1998-99	
Turnover (in Million Rs.)	**Total No. of Firms (Percent)**
Less than 5	64 (13.36)
5 to <10	24 (5.01)
10 to <25	61 (12.73)
25 to <50	47 (9.81)
50 to <100	46 (9.60)
100 to <150	35 (7.31)
150 to <200	17 (3.55)
200 to <300	20 (4.18)
300 to <400	17 (3.55)
400 to <700	11 (2.30)
700 to <1000	10 (2.09)
1000 to <2000	15 (3.13)
2000 to <5000	5 (1.04)
More than 5000	5 (1.04)
No information	102 (21.29)
Total	479 (100)

Source: Indian IT Software and Software Directory, (1999-2000), NASSCOM

Market share of the largest firms has declined from about 20 percent in 1998-89 to about 10 percent in 1998-99. This indicates that smaller firms (and probably new firms) have eaten away the share of the large firms. The smallest firm has a 0.00001 percent share of the market. Table 7 shows the market share wise number of firms in the software industry. Here we measure market share as percentage share of total turnover (in 1998-99) of software firms. It is clear from the table that around half of the total firms have a market share of just 0.05 percent. Only 2.5 percent of firms could manage to grab more than 1 percent market share.

Table 3.8 Market share of software firms	
Market share	**No. of Firms (Per cent)**
0.0001-0.0050	82 (17.12)
0.0051-0.0100	40 (8.35)
0.0101-0.0500	105 (21.92)
0.0501-0.1000	54 (11.27)
0.1001-0.1500	19 (3.97)
0.1501-0.2000	17 (3.55)
0.2001-0.3000	13 (2.71)
0.3001-0.5000	16 (3.34)
0.5001-1.0000	19 (3.97)
1.0001-2.0000	6 (1.25)
2.0001-5.0000	5 (1.04)
5.0001 and above	1 (0.21)
No information	120 (21.29)
Total	479 (100.00)

Source: Indian IT Software and services Directory, (1999-2000), NASSCOM

A similar structure is also seen in the case of export earnings. Table 8 shows the distribution of firms according to their exports volume. It is interesting that about half of the firms have exports earning less than Rs. 150 million. Among the software-exporting firms, less than 4 percent firms are earning more than Rs. 1,000 million.

Table 3.9 Export Share of Software Firms	
Exports (in Million)	**Total No. of Firms (Percent)**
Less than 5	65 (13.57)
5 to <10	23 (4.80)
11 to <25	50 (10.44)
26 to <50	33 (6.89)
51 to <100	41 (8.56)
101 to <150	24 (5.01)
151 to <200	19 (3.97)
201 to <300	12 (2.51)
301 to <500	14 (2.92)
501 to <1000	19 (3.97)
1001 to <2000	9 (1.88)
2001 to <5000	6 (1.25)
2000 to <5000	4 (0.84)
More than 5000	160 (33.40)
No information	479 (100.00)

The structure of Indian software industry is strikingly similar to that of the rest of the traditional industries in India. An implication of such a structure on technological capability of the industry has been well argued (Desai 1982; Siddharthan 1988; Nath 1993). Briefly, these studies suggest that major R and D expenditure and technological innovation are not likely events in an industry where all the firms (large or tiny) are offered similar products and services, and where the main market dynamics is price competition. Extending Arrow's (1971) argument it has been observed that large and small firms alike are likely to be engaged only in cost reducing minor innovations. From this perspective the prospect of Indian software industry to move up the value chain in the activities involving high investment/ high R and D/high risk/ high value looks quite distant. The same view has been echoed in a survey article in Business India (2002) that says, "moving up the value chain is going to be difficult for IT companies." "And many may be happier where they are they may not want to make the transition. After all, there will always be demand for cooks in Dubai."

Indian Software Industry Development – Current Decade (2000-11)

The Indian software industry has grown at a phenomenal com-pound annual rate of over 50 per cent during the 1990s, from modest revenue of US $ 195 million in 1989-90 to evolve into a $ 8.3 billion industry by 2000-01. Furthermore, the industry has earned 75 per cent of its revenue ($ 6.2 billion) from exports. The growth rates of revenues and of India's software exports in dollar terms are summarised in Table 2 and Figure 2. It is clear that except for 1996-97, the annual export growth rate has been higher than 50 per cent. The growth rate of overall revenue has been lower than that of ex-ports except for 1996-97 on account of a somewhat slower rate of growth of the domestic software market. However, the growth rates of overall revenues and of exports have tended to converge over the past couple of years as a result of the growth rates of the domestic software market picking up as well. To put this growth performance in an international perspective, the Indian soft-ware industry would account for roughly 2 per cent of the US $ 400 billion global software industry. However, India's share in the global market for customised software, that is, outsourced across borders is significant at 18.5 per cent in 1999 compared with 11.9 per cent in 1991 [Nasscom 2000a:4]. The growth rate of the Indian software industry has been substantially higher than the global software industry. Apparently India is the only country in the world to register a growth rate of around 50 per cent in the software industry. Based on a vision document prepared by McKinsey for the industry body Nasscom (Nasscom-McKinsey report), the government appointed National Taskforce on IT and Software Development (NTITSD) reported that the Indian software industry's growth to US $ 85 billion in revenue by 2008 , of which $ 50 billion is to come from exports, including $ 8 billion from export of products. The recent slowdown of the technology sector in the US, which consumes

the bulk of Indian exports, has tempered some of the assumptions that underpin these projections.

Table 3.9
Domestic and Export Market of Indian Software (Rs. Millions)

Year	Domestic (Percent)	Exports (Percent)	Total	Percent-growth with previous year
2000-01	91,564 (25)	273,548 (75)	365,112	83
2001-02	101,684 (23)	336,468 (77)	438,152	79
2002-03	124,605 (22)	429,525 (78)	554,130	84
2003-04	106,830 (16)	549,000 (84)	655,830	65
2004-05	213,750 (21)	791,505 (79)	100,525 5	73
2005-06	300,870 (22)	106,7310 (78)	136,818 0	70
2006-07	393,530 (20)	155,2822 (80)	194,635 2	76
2007-08	537,142 (21)	199,9482 (79)	253,662 4	87
2008-09	584,868 (20)	232,8380 (80)	291,324 8	93
2009-10	669,840 (21)	244,8048 (79)	311,788 8	83
2010-2011	863,700 (23)	288,0800 (77)	374450 0	-

Indian Software Exports, State Wise

Out of the total exports from India, Karnataka tops first and it is followed by Andhra Pradesh and Tamilnadu. During 1995-96, Karnataka ‘s total turnover was 626 million Indian rupees, where as in 2010 it is 107568 million. It is evident from the figures the growth had happenend in multifolds. Similar is the case of Tamilnadu and Maharashtra. 374 million rupeess to 44,725 million rupees and 1,574 million rupees to 54,921 million rupees . In the case of Maharashtra it is surprising that initially the state was showing a significant growth and later somehow it is not showing satisfactory growth with other states.From the table 3.10 below it is evident , among all these states the share of kerala is not so ambitious.

Table 3.10

Indian Software Exports, by State, 1995–2010, for 14 major states (in millions of rupees at constant prices of 1993–1994)

Year	KA	TN	MH	AP	DL	HA	UP	WB	OA	KL	MP	GJ	PN	RJ
1995	626	374	1,571	127	301	0	129	80	0	2	0	0	0	0
1996	1,189	489	1,774	158	430	0	188	94	0	6	0	0	0	0
1997	1,595	654	2,521	242	387	119	248	143	0	13	0	0	0	0
1998	2,235	1,124	3,836	277	986	170	385	251	3	17	0	2	0	0
1999	3,079	1,800	4,771	511	2,849	248	541	319	4	19	0	10	0	0
2000	4,386	2,725	6,321	857	3,459	458	770	410	9	29	0	12	0	0
2001	7,609	4,563	9,764	1,813	5,493	745	1,288	465	15	62	0	30	0	0
2002	12,630	7,502	12,751	2,127	9,458	1,442	1,644	743	28	196	0	40	0	0
2003	24,347	9,174	14,114	4,587	17,643	7,763	7,057	1,411	565	374	106	93	56	26
2004	29,158	13,171	18,703	7,037	26,027	6,448	8,255	2,434	726	442	239	183	99	99
2005	48,681	24,435	26,853	12,103	23,869	9,108	21,935	2,946	1,256	706	314	641	314	188
2006	71,786	36,465	37,866	18,052	14,215	17,923	15,451	4,363	1,545	909	544	754	433	278
2007	81,834	43,529	40,754	22,001	17,121	20,377	17,992	7,545	1,741	958	604	609	406	269
2008	107,598	44,925	54,921	28,152	19,412	27,732	19,689	8,874	1,803	1,212	693	782	1,009	277
2009	81,834	43,529	40,754	22,001	17,121	20,377	17,992	7,545	1,741	958	604	609	406	269
2010	107,598	44,925	54,921	28,152	19,412	27,732	19,689	8,874	1,803	1,212	693	782	1,009	277

Figure 3.1

Indian IT Industry – A segment wise representation

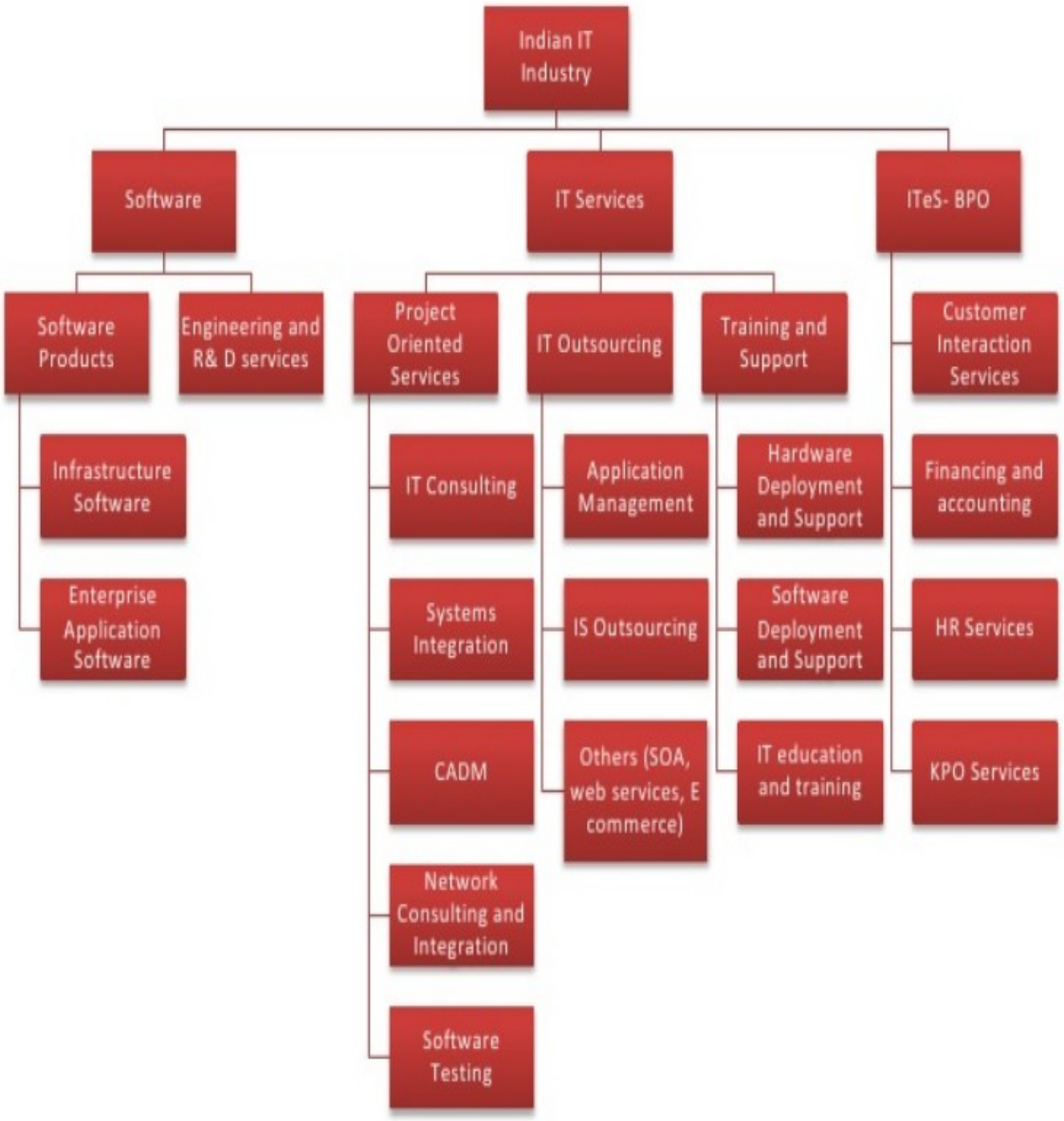
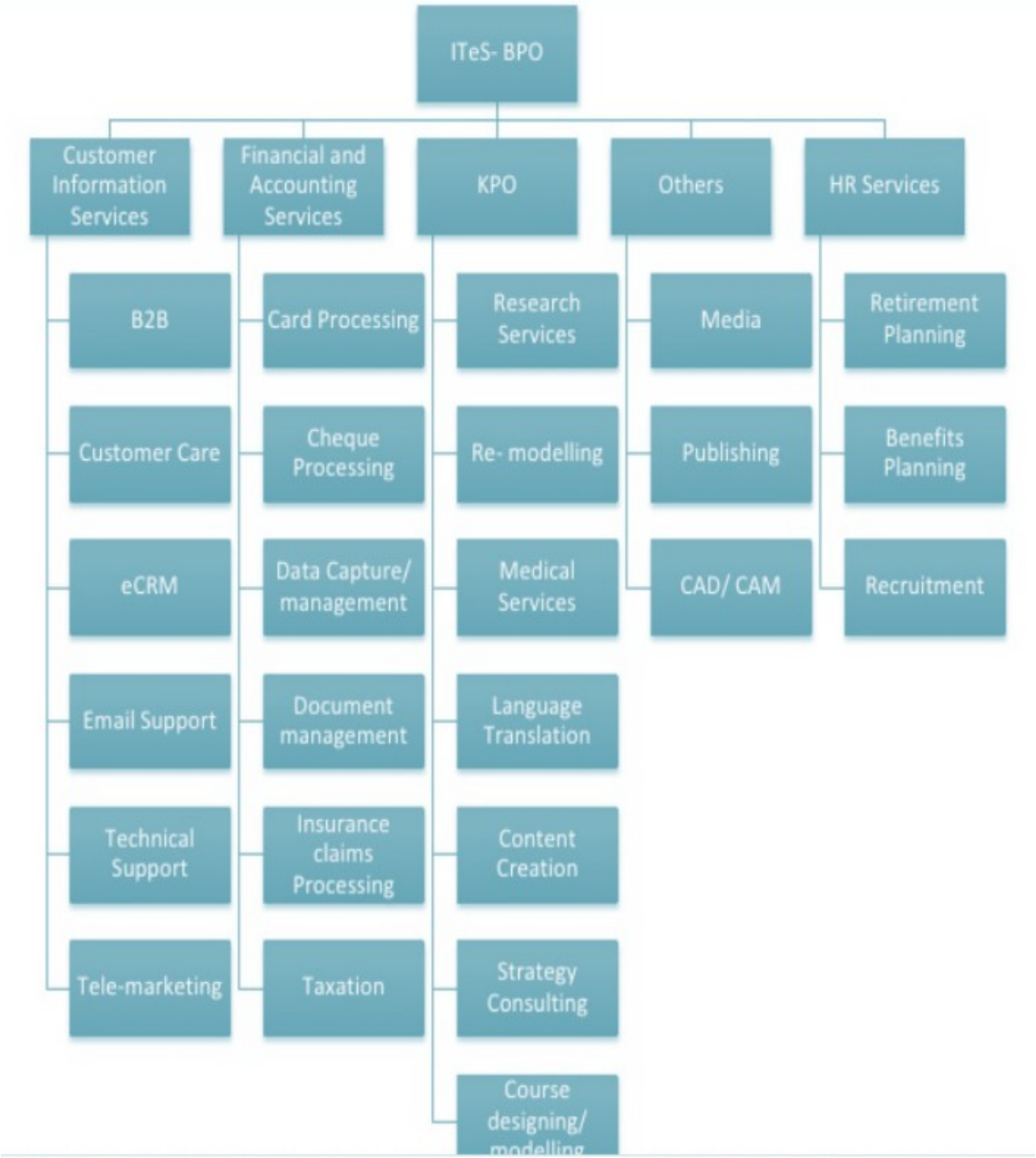


Figure 3.2

ITes- BPO Industry – Different Segment



Segment Wise – Revenue Contribution by main components

During these years IT services hold a major share steadily from 13.5 US $billion to 36.2 to US $billion, same type of growth can be seen in the BPO segment also from 5.2 US $billion to 14.7 US $billion. Nowadays IT services and BPO are the two fastest growing segments in India. Software and engineering services and hardware segment is not showing a promising growth.

Figure 3.3

Revenue contribution by main components (in $ billion)

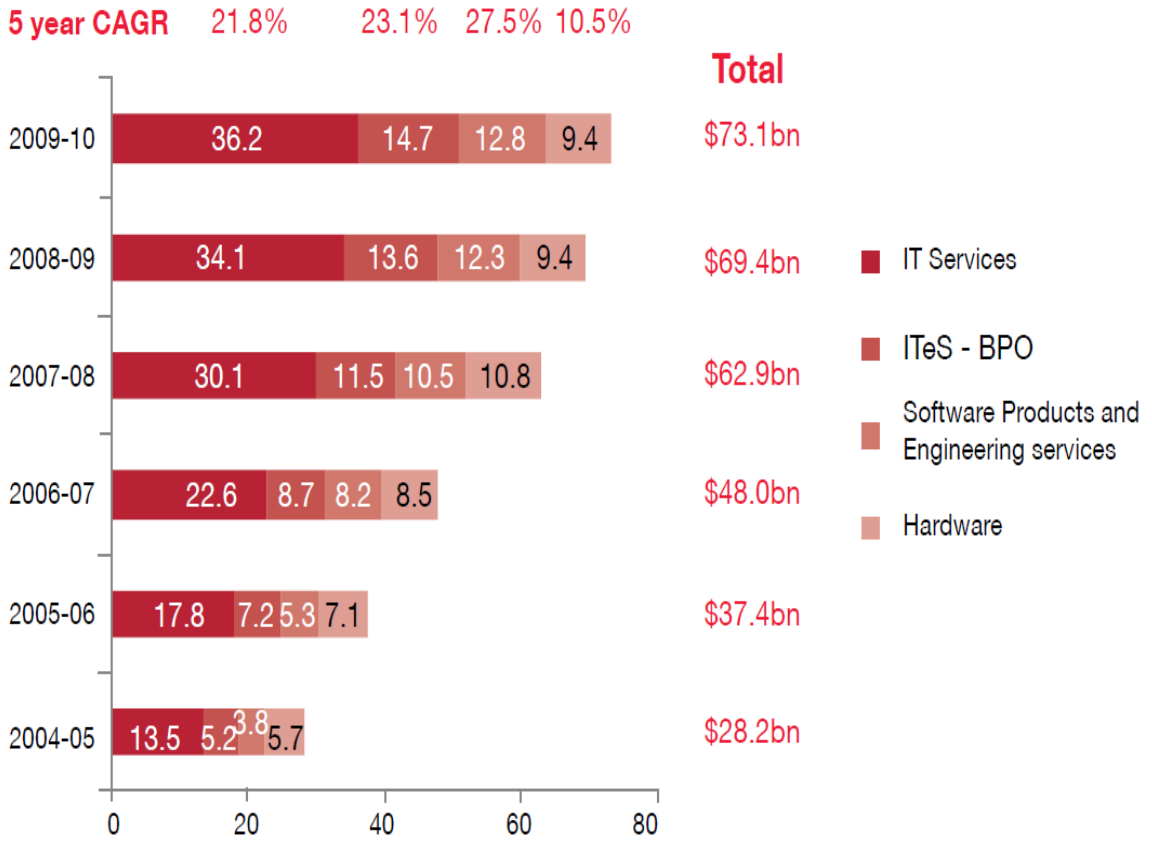


Figure 3.4

Revenue share by main components

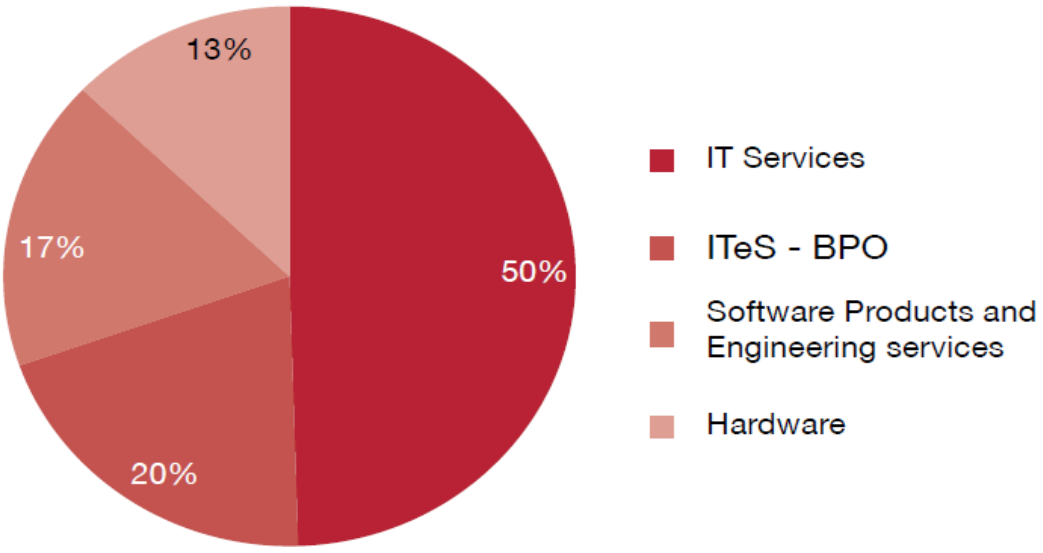
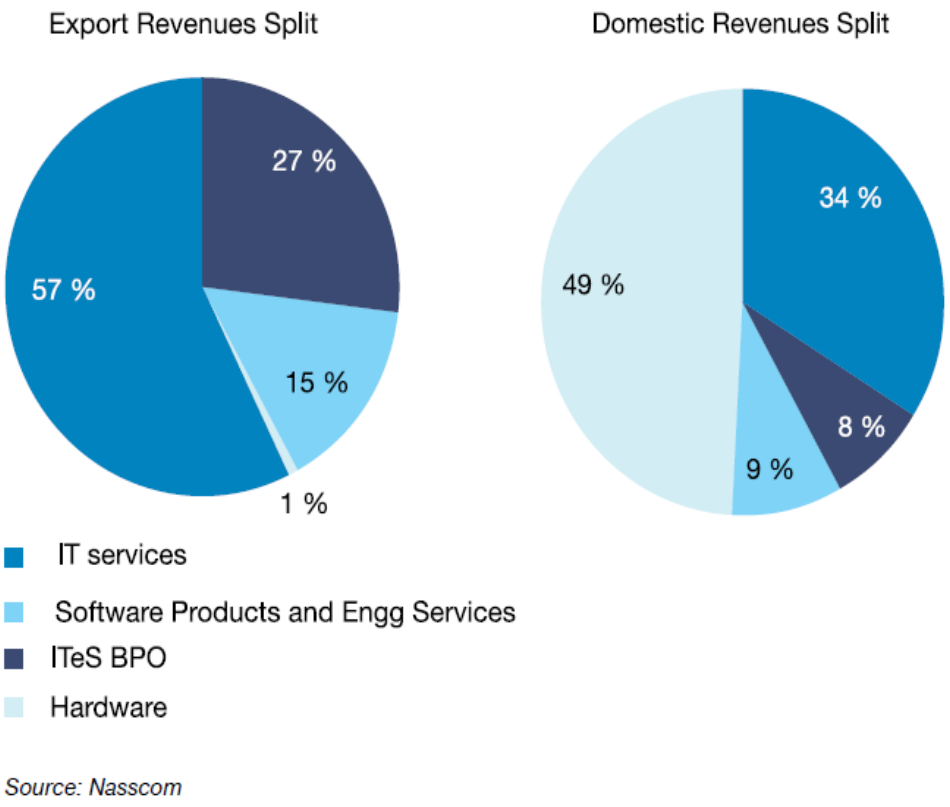


Figure 3.5

Component – wise breakup – Exports and Domestic



Source: Nasscom

Exports Revenue of IT services

Among the segments, the IT sector grew the fastest (22.4%) in revenue, which was the highest during FY09- 11. The surge in revenue was largely on the back of increased IT spending globally, as organisations that are emerging out the recessionary phase strive to remain competitive and improve efficiency. IT exports, which accounted for almost 75% of total revenue, are expected to have grown at an estimated 22.7% to US$ 33.4 bn during FY11. Growth in exports was led by major IT segments such as application development, which grew 21.8% as customer interest around various emerging platform such as cloud, mobile and other collaborative technology increased during the year. Indian IT companies also saw increased demand for outsourced IT services, which grew 23.8%, highlighting the focus of organisations globally to remain cost competitive.

Table 3.11 Export Revenue break of IT & ITes

In US$ million	FY07	FY08	FY09	FY10	FY11E
Project based	9,440	11,610	13,327	13,973	17,086
IT consulting	500	650	737	764	950
Systems integration	500	680	778	808	1,006
Custom application development	7,000	8,500	9,728	10,214	12,441
Network consulting and integration	200	280	320	332	398
Software Testing	1,240	1,500	1,763	1,855	2,291
Outsourcing	5,950	8,793	10,428	11,205	13,836
Application managements	2,100	3,100	3,677	3,879	4,726
IS outsourcing	1,620	3,293	3,930	4,346	5,476
Others(SOA & Web Services + E-Business/E-Commerce)	2,230	2,400	2,822	2,980	3,635
Support and Training	1,660	1,800	2,045	2,112	2,556
Software deploy and support	1,330	1,440	1,633	1,687	2,041
Hardware deploy and support	100	110	126	130	157
IT education and training	230	250	286	296	358
Total	17,050	22,203	25,800	27,290	33,478

The Indian ITeS BPO industry revenue is estimated to have reached US$ 16,917 mn, registering an annual growth rate of 15.2% during 2011. Although revenue growth was comparatively slower in 2011 vs. 18.2% CAGR over 2007-11, it marked a change in the decelerating trend in revenue growth since 2008. The export-oriented ITes BPO industry saw revival in exports with approximate 14% growth during 2011.The contribution of exports to total revenue, however, declined from 87.3% in 2007 to 83.5% in 2011. During 2007-11, although export performance of Indian IT companies remained

subdued due to moderation in global spending on IT-ITeS, domestic demand was robust at 26.1% CAGR vs. 16.9% growth in exports. Cost reduction has been the key growth driver in the industry. Nevertheless, a host of other factors such as access to talent, service quality, and productivity have also emerged important factors during the past few years to make the Indian ITeS BPO industry globally competitive. The Industry has evolved from the pioneering phase to enter into the 'growth and mature' phase with growth driven by accelerated adoption by buyers of different sizes, from across industry verticals and geographies with rapidly evolving supply-side maturity across service segments.

Figure 3.6

Component – wise contribution – Export revenues (in $ billion)

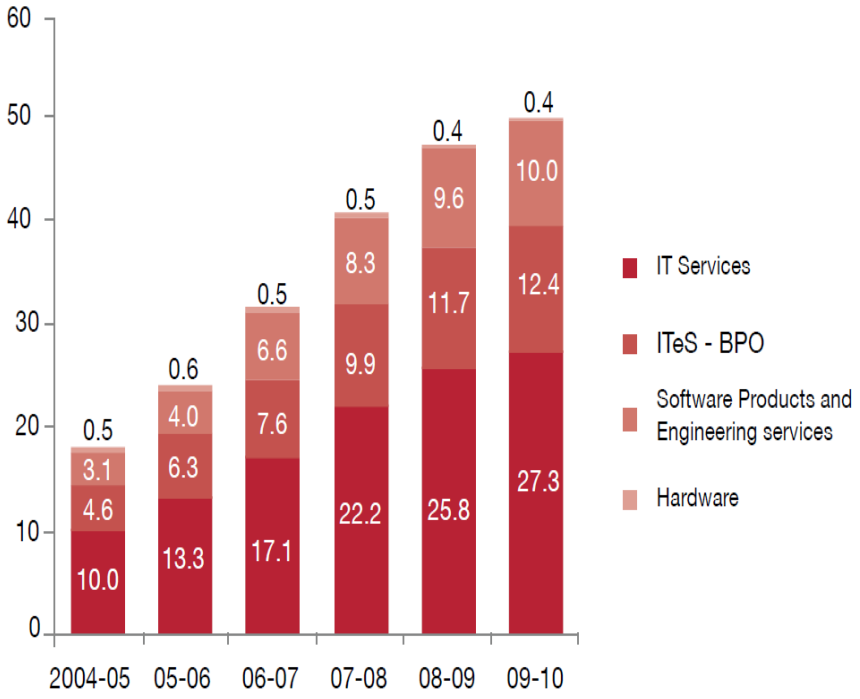
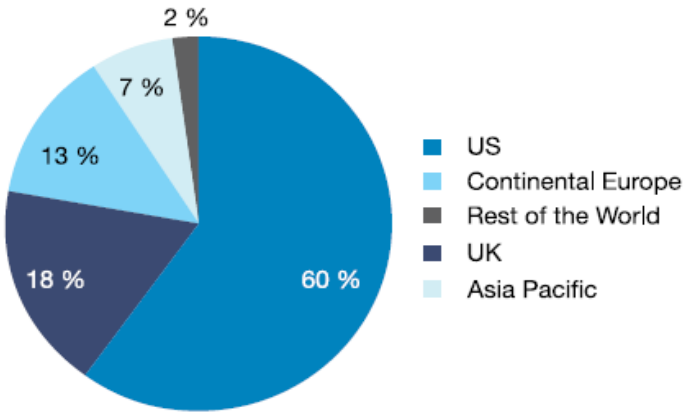


Figure 3.7

Geography-wise split of India's IT Exports



Source: Nasscom

Table 3.12
Global Offshore IT Service Spending by Importing Region

Worldwide Offshore IT Services Spending by Importing Region, 2008-2013 ($M)							
	2008	2009	2010	2011	2012	2013	2008-13 CAGR (%)
US	20,125.0	19,918.0	20,439.1	21,379.6	22,677.8	24,429.3	4.0
Canada	375.0	462.2	518.8	590.4	687.7	804.6	16.5
EMEA	9,818.3	10,362.6	11,130.1	12,179.1	13,426.8	14,978.9	8.8
Asia Pacific	687.0	766.0	910.0	1,112.0	1,351.2	1,640.8	19.0
Total	31,005.3	31,508.8	32,998.0	35,261.1	38,143.5	41,853.6	6.2

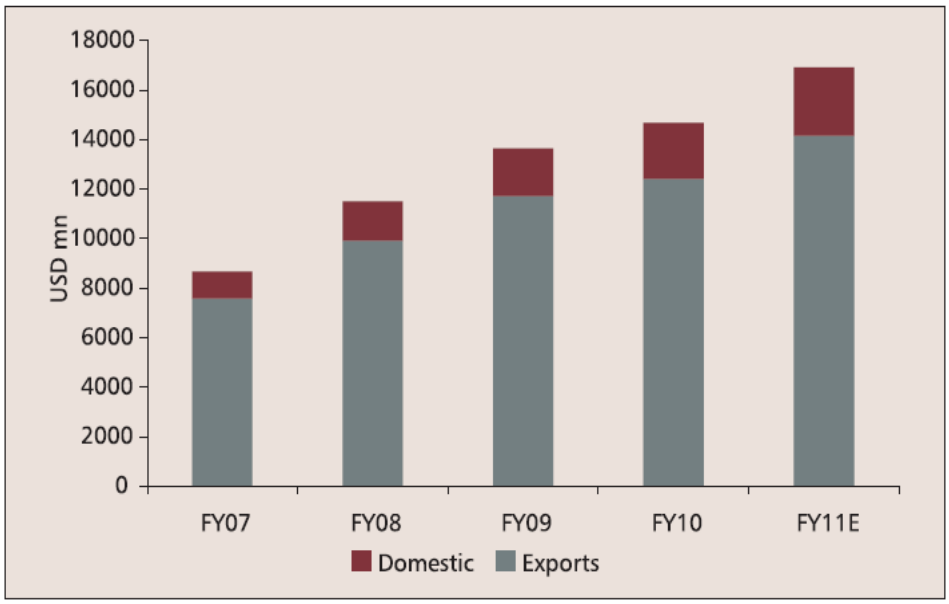
Source: IDC - Worldwide and U.S. Offshore IT Services 2009 – 2013 Forecast: A Transforming World

Table 3.13
Global Offshore IT Service Spending of Offering

Worldwide Offshore IT Services Spending by Foundation Market, 2008-2013 ($M)							
	2008	2009	2010	2011	2012	2013	2008-13 CAGR (%)
Application Outsourcing	4,770.6	5,145.8	5,631.3	6,267.3	7,054.3	8,069.3	11.1
Custom Application Development	8,138.5	7,977.5	8,084.4	8,342.5	8,691.5	9,136.4	2.3
IT Consulting	1,404.0	1,353.5	1,402.1	1,473.6	1,572.5	1,695.9	3.9
Infrastructure Outsourcing	2,169.7	2,410.3	2,725.0	3,157.4	3,694.1	4,452.7	15.5
Systems Integration	6,430.1	6,332.2	6,588.0	7,064.1	7,678.4	8,431.1	5.6
Other	8,092.4	8,289.5	8,567.2	8,956.3	9,452.8	10,068.2	4.5
Total	31,005.3	31,508.8	32,998.0	35,261.2	38,143.6	41,853.6	6.2

Source: IDC - Worldwide and U.S. Offshore IT Services 2009 – 2013 Forecast: A Transforming World

Figure 3.8
Revenue of the Indian ITes - BPO industry during 2007-11



Source: NASSCOM, The IT-BPO Sector in India, Strategic Review 2011; E stands for estimates

Table 3.14

ITeS – BPO Export Revenues

ITeS BPO Export Revenues

USD mn	FY07	FY08	FY09	FY10	FY11E	5 year CAGR
Customer Interaction Services	3520	4300	5123	5370	6014	14.3%
Finance & Accounting	1456	2122	2508	2721	3152	21.3%
Hr Admin	182	218	255	267	299	13.2%
Procurement and Logistics	52	61	70	77	89	14.4%
Knowledge Services	1255	1711	1994	2100	2500	18.8%
Other Horizontal Services	102	115	134	140	153	10.7%
Vertical Specific BPO Services	1003	1388	1620	1726	1933	17.8%
Total	7570	9915	11704	12401	14140	16.9%

Source: NASSCOM, The IT-BPO Sector in India, Strategic Review 2011; E stands for estimates

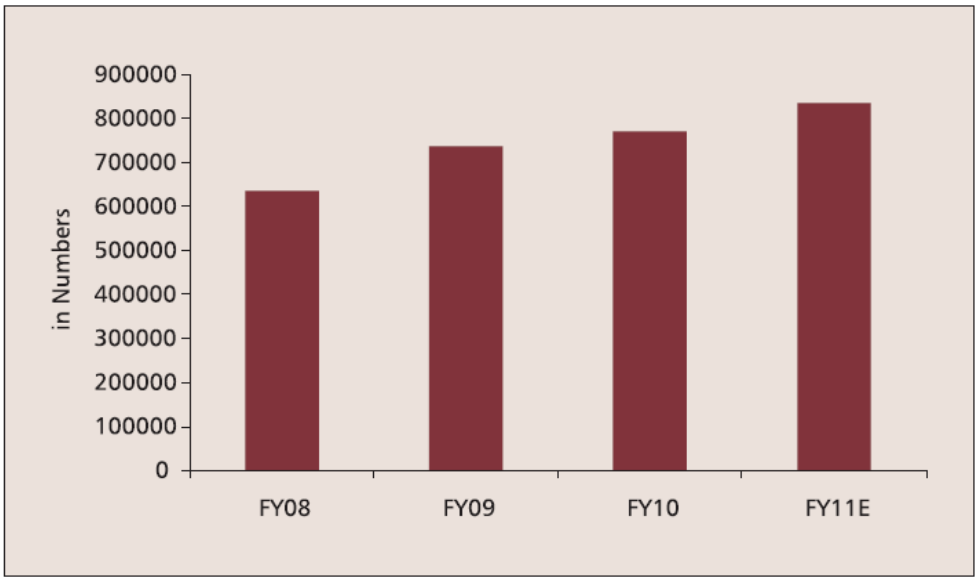
Information Technology & Employment

The potential contribution of information technology to employment generation is both direct and indirect. Directly, the growths of the computer hardware and software industries are generating new job opportunities in India. Indirectly, the adoption of computer technology by other industries expands the range of services they provide and can stimulate more rapid growth of these sectors. The indirect impact of IT is far larger than the direct impact. In the USA, it is estimated that for every direct job created in the IT industry, a minimum of ten additional IT-related jobs have been created in other industries in which IT is applied. This does not include the non-IT jobs created by the growth of other sectors of the economy under the stimulus of information technology.

IT is both a labor-creating and labor-saving technology. As the introduction of automated machines replaced manual labour in factories and on fields, it was once believed that the spread of computer technology would result in massive job destruction. However, two decades of experience has demonstrated that the

reverse is actually the case. Surely specific types of jobs are eliminated, but overall computerization creates far more jobs than it destroys. The spread of computerization acts as a catalyst for the growth of many types of businesses. This is not only true of businesses directly related to the computer industry, such as research and development, computer education, computer repair and maintenance. In fact, every sector of the economy is being energized by the adaptation of computer technology. Studies by the National Research Council in the USA have found that IT has a stimulating affect on the growth of a wide range of service industries. The fastest growing sectors of the global service economy—education, financial services, insurance and health services—have all expanded by adapting IT technologies. IT has demonstrable benefits for employment and skill levels. Evidence indicates that IT contributes to growth in demand for labour, as well as an overall skill upgrading in the workplace.

Figure 3.9
Employment base of the ITeS – BPO industry in India



Source: NASSCOM, The IT-BPO Sector in India, Strategic Review 2011

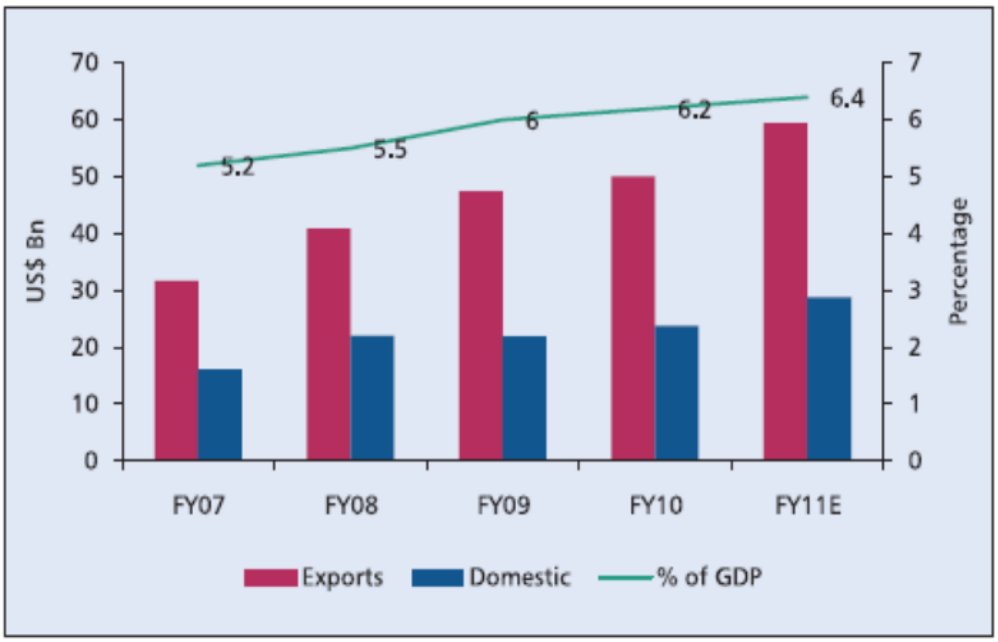
Direct employment in the IT services and ITeS segment was 2.3 million in the year 2010 and is estimated to reach nearly 2.5 million by end of the year 2011. Indirect employment of more than 8.3 million job opportunities is also expected to be generated due to the growth of this sector in 2010-11. IT services exporters are the biggest employers within the industry with 45% of total employment; domestic IT-ITeS services account for 22% of the workforce. These jobs have been

generated in diverse fields such as commercial and residential real estate, retail, hospitality, transportation, and security.

Indian IT-ITeS industry and Growth of the Services Sector

India has gained brand identity as a knowledge economy due to its IT and ITeS sector. The IT-ITeS industry has four major components: IT services, business process outsourcing (BPO), engineering services and R&D, and software products. The growth in the services sector in India has been led by the IT-ITeS sector, which has become a growth engine for the economy, contributing substantially to increases in GDP, employment, and exports. This sector has improved its contribution to India's GDP from 4.1% in 2005 to 6.1 % in 2010 and growth is estimated at 6.4% in year2011. The industry has attracted significant foreign investment, accounting for almost 8% of cumulative FDI inflows since Apr 2000 in the services sector. The industry has also helped expand tertiary education significantly. The top seven states that account for about 90% of this sector's exports have started six to seven times more colleges than other states.

Figure 3.10
Revenue break up of IT – ITeS industry and its share in GDP



Source: NASSCOM

Global environment and Indian IT-ITeS industry

The global environment for the IT-ITeS industry became increasingly challenging after the financial crisis with moderation in global IT spending and increased focus on value offerings along with cost. Indian vendors managed to effectively transform their business model focusing on discretionary spending in IT services and improving capabilities of IT-enabled services by undertaking more complex services.

Revenue growth of Indian IT-ITeS industry is expected to have regained momentum with an estimated 19.2% growth, aggregating to US$ 76.1 billion during 2011. This was largely on the back of revival in exports during the year. Exports, which account for almost 67.3%, grew at 18.7%, aggregating to approximately US$ 59.5 bn in 2011. IT services contributed more than half of export revenue (56.4%) whereas ITeS -BPO services were the second largest contributor (23.8%) to export revenue during the year. The domestic market continued with its growth momentum, recording 21% rise to reach at US$ 28.8 billion during the year.

Software Sector in the Indian Economy

The information technology (IT) and information technology enabled services (ITeS) industry has been one of the key driving forces fuelling India's economic growth. IT and ITeS sector's contribution to the national GDP has increased from 1.2 per cent in 1997-98 to an estimated 7.5 per cent in 2011-12.

IT has evolved as a major contributor to India's GDP and plays a vital role in driving growth of the economy in terms of employment, export promotion, and revenue generation.

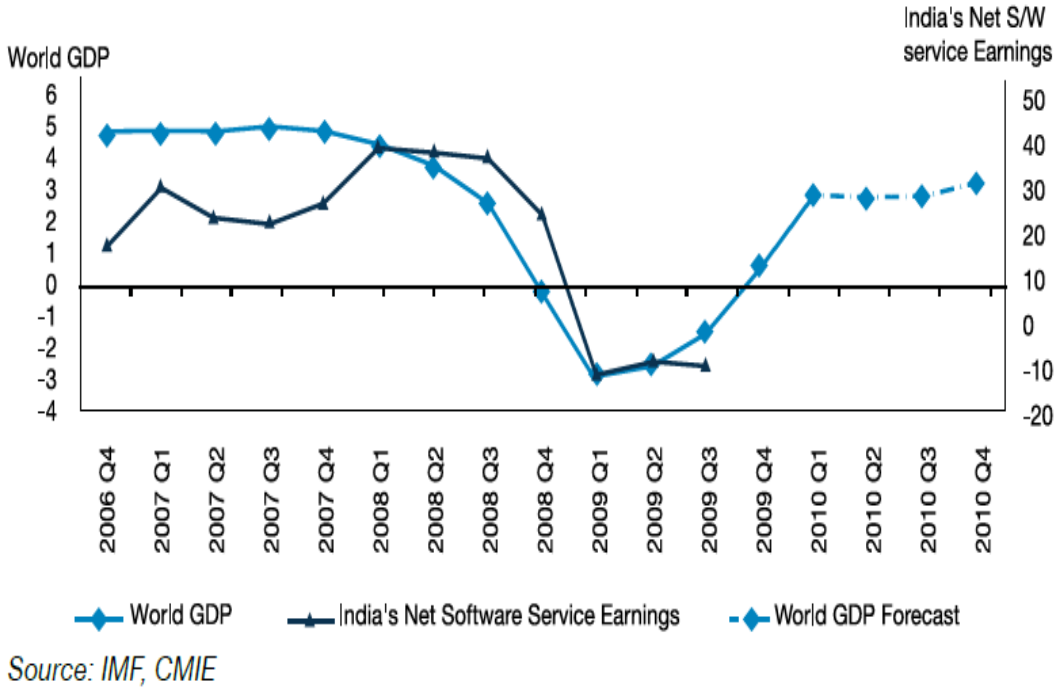
The IT-BPO sector is responsible for creating significant employment opportunities in the economy. Direct employment within the IT-BPO sector is expected to grow by over 9 per cent to reach 2.77 million, with over 230,000 jobs being added in 2011-12. IT services exports (including Engineering Research and Design (ER&D) and software products) continue to be the largest employer within the industry with nearly 47 per cent share of total direct employment, BPO exports generate about 32 per cent of the total industry employment,

and the remaining 22 per cent is accounted for by the domestic IT-BPO sector. The sector is responsible for enabling employment to an additional 8.9 million people in various associated sectors - catering, security, transportation, housekeeping, etc.

The software sector has already grown from 0.3 percent contribution to GDP in 19990-91 to 1.5 percent in 1999. At the same time it is also to be noted that despite rapid growth and having many cost related and technical advantages in this sector the share of Indian software products and services in the global export market is around only 1 percent and has stagnated these for quite some time. This indicates that the global market is expanding at a much faster rate than the capability of Indian software industry in expanding its share in the global market. The performance of the industry in recent past in the domestic and export market. The table clearly brings out increasing export dependence of the industry. We, therefore, observe two conflicting trends of growing export dependence and stagnant share in the world market. Is it because of limited capability of Indian software companies that the industry in general could not expand its market share in the expanding global market.

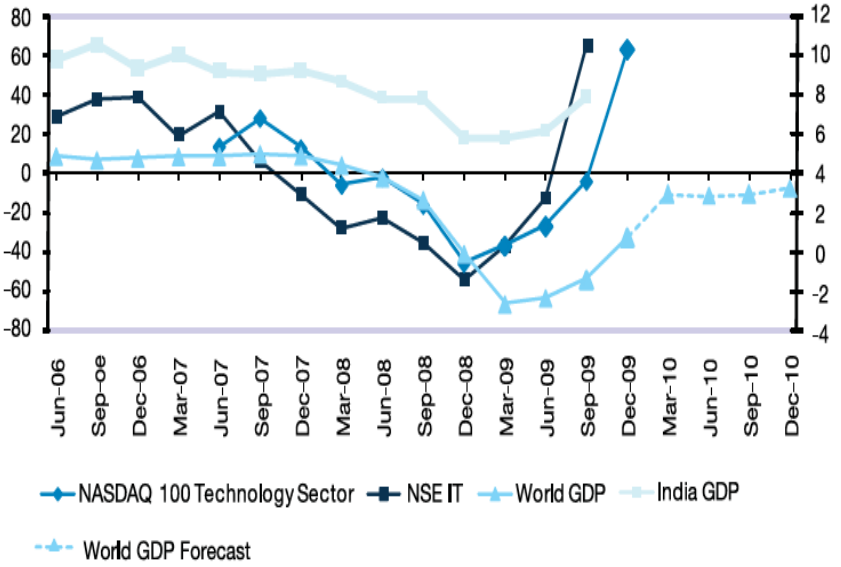
Figure 3.11

Growth Trends in Global GDP and India's Net Software Service Earnings



Source: IMF, CMIE

Figure 3.12
Trends in Growth of GDP and Technology Indices



Source: NSE, NASDAQ, IMF, Government of India

2011

Figure 3.13
IT-ITeS Exports from Kerala

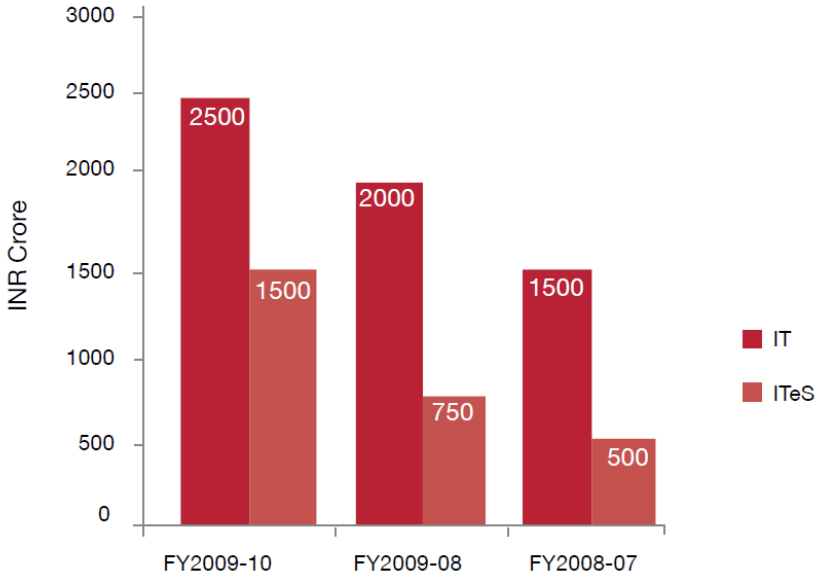


Figure 3.14
Number of IT – Ites companies

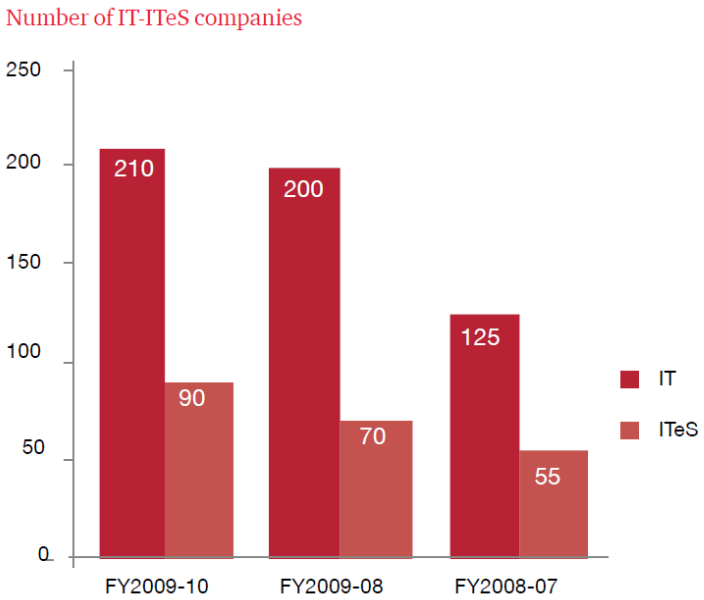


Figure 3.15
Break up of companies

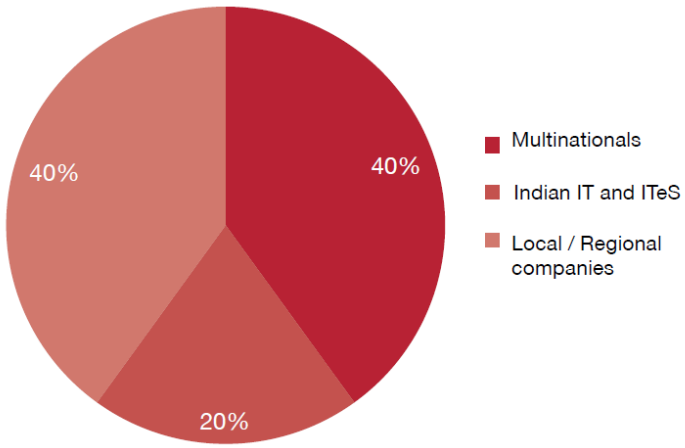
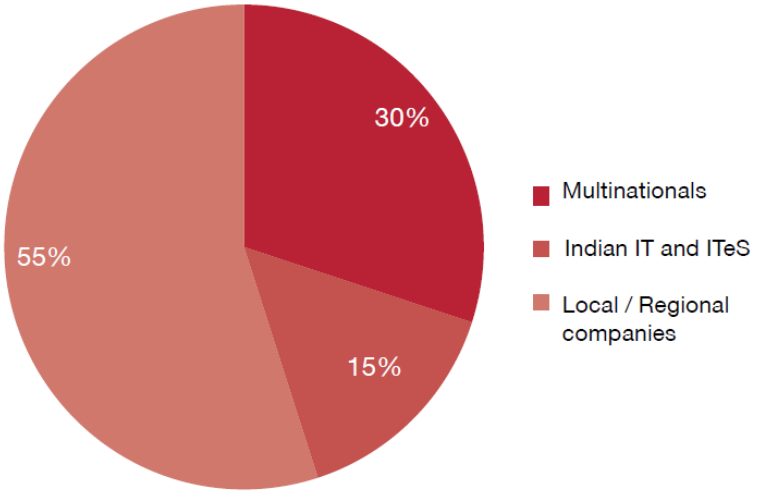


Figure 3.16

Break up of employees



NOTES

Full report of the Task Force is available from http://it-taskforce.nic.in
Model details from
http://www.students.cs.run.nl/-hurk/scrptie/waterfall.html

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Chapter 4
Socio – Economic Profile of the Employees

4.1 Introduction

Women have been working in each and every society of the world since the beginning of human civilization. Participation of socio economic activities are prevalent in all countries. One of the striking features of women's labour force participation is its drastic change in size and composition in the last several decades. However, women have been largely ignored over the years and has resulted in poor economic position and low status of women. Women from one third of the world's labour force, but are concentrated in the lowest paid occupations and are vulnerable to unemployment(U.N Report,1995).

Cross national studies on female labour force participation focus on the point that despite the tremendous growth in the size of the female labour force women still hold traditional jobs, occupy low status jobs and earn much less than men do(Papola ,T.S 1993). Women in the state inspite of enjoying better status and position compared to other parts of the country have low levels of participation in economic activity.It has one of the lowest levels of per-capita income in the country,as well as highest levels of unemployment (State Planning Board :2003).While the state accounts for only 4 percent of India's population, its unemployment rate is high at 31 percent, with 14 percent of males and 48 percent of the females in the state being unemployed(NSSO:2000)

4.2 General Profile of IT Professionals

The general population of IT employees consists of more than 70% of males and the rest 30% females.(NASSCOM,2010). Giving gender inequality, these relative proportions are unsurprising. But in the sample population for the purpose of the detailed study of how the gender status have changed, deliberately took 61.08 percent of females and 38.2percent of females. Hindu, upper caste holds 65 percent of the population, 15 percent Christian, 5 percent muslims and 5 percent of other backward caste, (A.R.Vasavi,2006). The sample data confirms the same. The average age group of the IT population is 26.5 years NASSCOM, 2010, where as it agrees with the sample data. 46

percent are from the age group 26-30 and 34 percent from 20-25 age groups. The higher age group 31-35 and 36-40 holds 16 and 4 percent respectively. The educational background of the techies is B-Tech or MCA. Out of the total respondents 66 percent are engineering degree holders, 10 percent are MBA and PG holders, Degree and Diploma holders are 12 percent. 55.5 percent are single in relationship status and 42.9 percent are married and 1.7 percent doesn’t want marriage.

Table 4.1

General profile of the respondents

Characteristics	Group	Frequency	Percent
Sex	Female	147	61.8
	Male	91	38.2
Religion	Hindu	159	66.8
	Christian	51	21.4
	Muslim	23	9.7
	Others	5	2.1
Caste	Forward Caste	97	40.8
	Backward caste	54	22.7
	Others	66	27.7
	Not responded	21	8.8
Age group	20-25	80	33.6
	26-30	110	46.2
	31-35	37	15.5
	36-40	11	4.6

Table 4.2

Educational and Relationship status of the respodents

Characteristics	Group	Frequency	Percent
Education	Diploma	9	3.8
	Degree	20	8.4
	B-Tech	156	65.5
	Others	13	5.5
	M.Tech	16	6.7
	MBA & PG	24	10.1
Relationship status	Single	132	55.5
	Married	102	42.9
	Don't want	4	1.7

4.3 Caste

Caste and religion played a major role on the type work and activities engaged by people from Vedic times in India. The caste system is one of the most important basis of social stratification which is focused on the type of work that group is engaged with.

“Caste appears to be an institution of a highly complex origin, an origin so complex indeed that in its very nature it must be limited to a single area, and that no doubt, why it is only found in India. No comparable institution to be seen elsewhere has anything like the complexity, elaboration and rigidity of caste in India” (Hutton,J.H.1973).

Has the IT-ITES sector provided employment to a broad cross-section of the population, expanding India’s new middle classes (Deshpande 2003; Fernandes 200) or only reinforced existing caste-class-gender divisions by drawing primarily on the existing educated middle class for its workforce.

Our study observed that there is high concentration of employees from certain communities whereas others holding a negligible share. The following table explains the distribution of respondents according to caste. In the case of the class the study found that it follows the national level studies that the sample from keralam is also holding a big chunk of the educated middle class as its workforce.

Table 4.3

Distribution of respondents among gender and Educational Qualifications

Sex	Educational qualifications						
	Degree	Diploma	B-Tech	M.B.A & PG	MTech	MCA	Total
Female	2.7%	10.9%	63.3%	6.1%	6.8%	10.2%	100.0%
Male	5.5%	4.4%	69.2%	4.4%	6.6%	9.9%	100.0%
Total	3.8%	8.4%	65.5%	5.5%	6.7%	10.1%	100.0%
Pearson Chi-Square: 4.581[a]				P Value =0.469			

As the female literacy and progressive attitudes are high in the state, kerala, again it is observed from the table that 63.3% are engineering degree holders, 10.2% are MCA's, 6.8 % are M.Tech, which is almost close with the male status. And thus there is no significant relationship between the gender and the educational qualifications.

4.4 The Mean age at Marriage

In kerala both men and women get married at a higher age, when compared to India as a whole. Mean age at marriage in Kerala for males and females in rural area is 27.6 and 21.2 respectively. And in urban area 28.9 and 22.7 respectively which is higher compared to the national average in rural 24.2 and 19.0 respectively and urban areas 26.5 and 21.5 respectively in 1998-99 (International Institute for Population Sciences2001*).The age at marriage for both males and females in kerala is higher than the national average through out the period depicted in Table 4.3.

Table 4.4
Mean age at Marriage

Period	Kerala		India	
	Males	Females	Males	Females
1961	26.3	19.8	20.0	14.5
1971	26.7	21.1	22.4	17.2
1981	27.7	21.9	23.4	18.7
1991	27.7	22.2	24.0	19.3
2001	27.9	21.5	24.9	19.7

Source: (i)Women in Kerala,1989 (ii) Economic Review 2003

* International Institute for Population Sciences2001, National Family Health Survey 1998-99: Kerala, Mumbai.

Table 4.5

Age at Marriage of the respondents

Sex		Age	Age at marriage	Age of spouse
Female	Mean	26.21	24.98	32.44
	N	147	62	61
	Std. Deviation	4.016	2.192	4.470
	Minimum	21	21	21
	Maximum	42	30	44
Male	Mean	27.64	27.68	27.33
	N	91	34	36
	Std. Deviation	3.834	2.198	3.397
	Minimum	20	25	22
	Maximum	43	35	39

In the case of the IT employees the mean age at marriage for females is 24.98 approximately 25 and for males it is 27.68 approx 28 respectively. It shows a consensus with the survey report of Economic Review in the case of male age where as the female age at marriage in the sample,24.98 is highly differing from the state average,21.5. It highlights the change in attitude of the kerala society in the case of female education, employment and marriage.

Table 4.6
Distribution of age of unmarried respondents

Sex	N	% of Total N	Mean	Minimum	Maximum	Std. Deviation
Female	80	60.6%	24.10	21	36	2.197
Male	52	39.4%	25.63	20	30	2.368
Total	132	100.0%	24.70	20	36	2.379

But the wondering fact among the sample data of IT-employees is that 50% of the female respondents are unmarried with maximum age as 36 and minimum of 21. In the case of male respondents the maximum age is 30.

4.5 Employment and Income of the Spouse

The middle class families in kerala society is showing that both the partners are working, when it is checked against the sample data it shows that 95.5% of the female responded that their spouse is employed where as 3% doesn't employed at all. In the males 69.4% responded that their partners do employed where as 30% of the male respondent's partners doesn't employed at all. When looking in to the Total 86.3% respondents agreed in the case of employment of the spouse where as 12.7% negate it.

Table 4.7

Distribution related to the employment of the Spouse of the respodents

Employed or not	Sex		Total
	Female	Male	
Yes			
	95.5%	69.4%	86.3%
No			
	3.0%	30.6%	12.7%
Total	100.0%	100.0%	100.0%

Table 4.8

Distribution related to the gender and income of the spouse

	Sex	Income of the spouse						Total
		10000 <=	11k - 25k	26k - 50k	51k - 75k	76k - 1 lakh	1 lakh>	
Female	% within Sex	9.4%	20.8%	32.1%	22.6%	7.5%	7.5%	100.0 %
	% within Income of the spouse	62.5%	57.9%	73.9%	92.3%	80.0%	80.0%	72.6%
Male	% within Sex	15.0%	40.0%	30.0%	5.0%	5.0%	5.0%	100.0 %
	% within Income of the spouse	37.5%	42.1%	26.1%	7.7%	20.0%	20.0%	27.4%
Total	% within Sex	11.0%	26.0%	31.5%	17.8%	6.8%	6.8%	100.0 %
	% within Income of the spouse	100.0 %	100.0 %	100.0 %	100.0 %	100.0%	100.0 %	100.0 %
	Pearson Chi-Square: 11.187[a] , Significant at 5% level							
	Note: Figures in parentheses are percentages Source: Survey							

As men is supposed to be the main bread winner and is free from the rearing and bearing activities, spouse of the female employees is included in to the higher income group as 73.9%,92.3%,80.0%,80.0% respectively in to 26k-50k ,51k-75k, 76k-1 lakh, and 1 lakh, where as

spouse of the males are also integrated in to the higher income group with shares such as 26.1% ,7.7% ,20.0%,20.0% respectively.

Family – Work – Time Utilisation

Marital Status and kids decide a women's career growth to a large extent apart from the glass ceiling effect. Out of the total respondents 55.5 percentages stays Single and 42.9 are Married. Out of which the females have prolonged the age at which they are getting married as well choose to get late marriage or stay single forever. shows the change in the attitude with the females, as the development indicators of the state shows high.

Table 4.9

Number of kids

	Frequency	Percent	Valid Percent	Cumulative Percent
0	47	46.1	46.1	46.1
1	42	41.2	41.2	87.3
2	13	12.7	12.7	100.0
Total	102	100.0	100.0	

Whether to have kids or not is another parameter which affects the career ladder being women. So a woman who decides to stay back with the career chooses very carefully the type of relationship and family they wants to have. Without a strong alternative support system either Parents, In-laws, Care takers women IT professionals prolonged their decision on kids. The table shows out of the total married respondents 46.1% don't have kids, where as 41.2% percentage have single kid and 11.1% percentage have two kids. Thus we can see that the size of the family is decreasing among the IT employees.

Table 4.10

Distribution related to gender and number of kids

Sex	Number of kids			Total
	0	1	2	
Female	43.9%	42.4%	13.6%	100.0%
Male	50.0%	38.9%	11.1%	100.0%
Total	46.1%	41.2%	12.7%	100.0%
Pearson Chi-Square: .373[a]				
Note: Figures in parentheses are percentages Source: Survey				

The Cross tabulation table 4.10 shows that there is no significant relationship between gender and the number of kids among the selected sample. Gender doesn't play a role in deciding the size of the family, where as only 25% of the women choose to baby boomers.

However empowered they are feel, almost all women IT professionals still give their families higher priority than their work and – like nearly all women in India and much of the rest of the world – they do not regard paid work as 'any part of women's normal duties' in the way that it is for men (Sharma 1986: 129). Conversely, largely because it is seen as a duty , women – especially married women – consistently assume more familial responsibility than men.

Day To-Day Time Utilisation

Day To-day time utilisation among the employees is checked in the sample group of IT Employees. There is no significant difference in the working hours among the gender.

t-Test is being used to check whether there is any significant difference among gender in the working hours at office and at home.

Hypothesis: *There is no significant difference between the working hours at office among the gender.*

Hypothesis Test: Independent Groups (t-test, pooled variance),

Table 4.11
t-Test among gender and working hours at office

Groups	Females	Males
Mean	8.75	8.69
Std. dev.	0.84	0.99
n	64	35

The P value of the result shows that there is no significant relationship between gender and working hours at office

Hypothesis: *There is no significant difference between the working hours at home among the gender.*

Hypothesis Test: Independent Groups (t-test, pooled variance)

Table 4.12
t-Test among gender and working hours at home

Groups	Female	Male
Mean	3.11	1.43
Std. dev.	2.21	1.20
n	64	35

There is significant difference in the usage of time or the working hours at home of the married female and male IT employees. The t – test is significant at 1% level of significance.

Table 4.13

Sex		Self	Spouse	Joint	Servant	Parents	In-laws	Others	
Female		23.8%	6.3%	49.2%		4.8%	1.6%	14.3%	100.0%
	Discharge of household activities	83.3%	36.4%	60.8%		60.0%	100.0%	81.8%	64.3%
Male		8.6%	20.0%	57.1%	2.9%	5.7%		5.7%	100.0%
	Discharge of household activities	16.7%	63.6%	39.2%	100.0%	40.0%		18.2%	35.7%
Total	% within Sex	18.4%	11.2%	52.0%	1.0%	5.1%	1.0%	11.2%	100.0%
	% within Discharge of household activities	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Pearson Chi-Square: 10.720[a] P Value : 0.097 Note: Figures in parentheses are percentages Source: Survey									

Distribution related to the discharge of household activities

Looking in to the pattern of discharging household activities, out of the total respondents those who are doing the household activities by themselves are females by 83.3% and males by 16.7%. 63.6% of the male respondents agreed that they are not part of the household activities. Out of the respondents who agreed of discharging the household activities jointly, males hold a share with 39.2% and females with 60.2%. But out of the total male respondents 57.1% showed the readiness to be part of the household chores with a high share where

as only 49.2% the female IT professionals find it hard to get their partners changed their attitude. As we look more keenly in to the change in the pattern of discharge of household activities especially to the female respondents we find 4.8% and 1.6% found support system from parents and In-laws where as servants are not part of the alternative supporting system. There is no significant relationship between gender and discharge of household activities

Living arrangements among IT professional

As the software companies are located in metros, how the living arrangement among the IT professionals differs among the gender as the relationship status varies is of considerable interest. The sample data here shows that women are moving out of the families and homes in search of better jobs.

Table 4.14
Distribution of living arrangements of the respondents who are single

Sex	Living arrangements						Total
	Rented	P.G.	Home	Own flat	With relatives	Not responded	
Female	21.3%	27.5%	27.5%	5.0%	3.8%	15.0%	100.0%
Male	13.5%	5.8%	44.2%	5.8%	5.8%	25.0%	100.0%
Total	18.2%	18.9%	34.1%	5.3%	4.5%	18.9%	100.0%
Pearson Chi-Square: 13.479[a] Significant at I% level							
Note: Figures in parentheses are percentages Source: Survey							

In the above cross tabulated data it is evident that a considerable amount of female employees who are single are thriving in the industry even if the total share of female work participation is around 30% (NASSCOM, 2011). Later when we are looking in to the selection

process it is more clear that women's entry in to the software industry is mainly through campus recruitment rather than from direct application or through known networks. In the case of male recruitment there are multiple entry possibilities. It shows the selection criteria are much stronger or we can say there is sort of gender embodied in the selection process. In short young women IT professionals are floating from metros to metros for better employment prospects in the industry. The cross tabulation among the gender and living arrangements among the shows women are 21.3% and 27.5% using rented and P.G accommodation where as 13.5 % and 5.8% males are using these living arrangements. Again the Chi square analysis also showing a co-efficient value 13.479 and it is significant at 1%.

Table 4.14
Distribution related to living arrangements of married

Sex	Living arrangements				Total
	Rented	P.G.	Home	Own flat	
Female	34.8%	4.5%	47.0%	13.6%	100.0%
Male	50.0%		44.4%	5.6%	100.0%
Total	40.2%	2.9%	46.1%	10.8%	100.0%
Pearson Chi-Square: 4.409					
Note: Figures in parentheses are percentages Source: Survey					

In the case of married people there is no significant relationship between gender and Living arrangements the male and female employees have chosen similar living arrangements without much variation in the percentages. But still there is a small percentage of the female employees opting for P.G accommodation where males are not.

It shows that women are taking extra efforts to be employed than to be with the family.

Size of the Family (Single)

48.7% of the total respondents have the family size 2-4 where as only 14.7% and 19.7% having the family size two and 4-6 respectively as 5 percent have the family size greater than six.

Table 4.15

Distribution related to the size of the family

Size	Frequency	Percent
2	35	14.7
2 - 4	116	48.7
4 - 6	47	19.7
6>	12	5.0
Not responded	28	11.8
Total	238	100.0

Table 4.16

Size of the Family (Married)

Size	Frequency	Percent
2	24	23.5
2 - 4	53	52.0
4 - 6	22	21.6
6>	3	2.9
Total	102	100.0

Out of the married respondents 53 % have the family size 2-4 where as only 22 % have 4-6 size of the family and 24% have the family size two. Only two percent have the family size greater than six.

Parental Education of the Respondents

Table 4.17

Distribution related to the educational status of respondents father

Sex	Educational status of the Respondent's fathers										
	Below SSLC	SSLC	Pre degree	Diploma & ITI	Degree	B Tech & MCA	M Tech	MBA & PG	Others	Not responded	Total
Female		9.5%	4.8%	10.2%	38.1%	2.7%	.7%	12.9%	1.4%	19.7%	100.0%
Male	1.1%	17.6%	9.9%	6.6%	36.3%	6.6%		9.9%	3.3%	8.8%	100.0%
Total	.4%	12.6%	6.7%	8.8%	37.4%	4.2%	.4%	11.8%	2.1%	15.5%	100.0%

Father's educational background of the female respondent's is showing a marginal high as more of them are more qualified than the male respondents, but the Chi-Square analysis doesn't show any significant relationship between gender and the educational background of their father's.

Table 4.18
Father's Educational Status of the Respondents

Education	Frequency	Percent
Below SSLC	1	.4
SSLC	30	12.6
Pre degree	16	6.7
Diploma & ITI	21	8.8
Degree	89	37.4
B Tech & MCA	10	4.2
M Tech	1	.4
MBA & PG	28	11.8
Others	5	2.1
Not responded	37	15.5
Total	238	100.0

Out of the total respondents more than 99% have at least passed matriculation 45% are degree and diploma holders, 16 % are post graduate holders. It is highly evident that educational background of the father's education holds a good role in children's career.

Table 4.19

Distribution related to mother's education of the respondents

	Mother's education group								
Sex	Below SSLC	SSLC	Pre-Degree	Diploma / TTC/ITI	Degree	Professional Courses	Post Graduate Courses	Not Responded	Total
Female	1.4%	11.6%	15.0%	5.4%	37.4%	.7%	6.8%	21.8%	100.0 %
Male	2.2%	24.2%	12.1%	5.5%	28.6%		14.3%	13.2%	100.0 %
Total	1.7%	16.4%	13.9%	5.5%	34.0%	.4%	9.7%	18.5%	100.0 %

In the case of mother’s education of the females 43% holds degree/diploma where as 7% are post graduate holders, where as 34% of the males mother’s hold degree/diploma where as 14.3% are post graduates.But the Chi-square analysis shows no significant relationship between gender and mother’s education

Table 4.20
Mother's Education Status of the Respondents

Educational Status	Frequency	Percent
Below SSLC	4	1.7
SSLC	39	16.4
Pre-Degree	33	13.9
Diploma/TTC/ITI	13	5.5
Degree	81	34.0
Professional Courses	1	.4
Post Graduate Courses	23	9.7
Not Responded	44	18.5
Total	238	100.0

Respondents mother's educational status shows that 40 percent are degree and diploma holders and 9.7 percent are PG holders hardly 1 percent haven't cleared matriculation, where as 16.4 percent and 13.9 percent holds matriculation and pre-degree respectively.

Parental Occupational status of the respondents

Occupational status of parents has a competitive role in the education and career of the children. Various studies have shown it plays a lead role in the career of the new generation.

Table 4.21
Gender * Father's occupation Cross Tabulation

Sex	Father's occupation					Total
	Government	Private	Business	Labour	Nil	
Female	46.1%	19.1%	22.0%	3.5%	9.2%	100.0%
Male	42.5%	20.7%	20.7%	2.3%	13.8%	100.0%
Total	44.7%	19.7%	21.5%	3.1%	11.0%	100.0%

It is evident that 46 % and 42.5% of females and males father's are government employees where as the private and business occupational holders are almost equal in share for both males and females. Only a small share are from labour and not employed category.

Table 4.22
Frequency table of father's occupational status of the respondents

	Occupation	Frequency	Percent
	Government	102	42.9
	Private	45	18.9
	Business	49	20.6
	Labour	7	2.9
	Nil	25	10.5
	Total	228	95.8
Missing	System	10	4.2
Total		238	100.0

It is very much clear that 42 percent of the people belongs to the government employees, 20 percent are in the business group, 18.9 percent in the private sector, 2.9 percent belongs to labour class and 10.5 are not employed.

Table 4.23

Distribution related to Mother's occupational status of the respondents

Sex	Mother's occupation					Total
	Government	Private	Business	Labour	House wife	
Female	20.6%	7.8%	3.5%	.7%	67.4%	100.0%
Male	20.5%	9.1%	2.3%		68.2%	100.0%
Total	20.5%	8.3%	3.1%	.4%	67.7%	100.0%

67.4 percent of mother’s belong to house wife category of female where as in the case of males it is 68.2 %, government employees holds a share of 20.6% & 20.5%,the private sector employees have a share of 7.8% & 9.1%, the business group category 3.5% & 2.3% respectively for females and males. It is evident from the data there is no significant relationship between gender and mother’s occupation.

Table 4.24

Frequency table of mother's occupational status of the respondents

	Occupational Status	Frequency	Percent
	Government	47	19.7
	Private	19	8.0
	Business	7	2.9
	Labour	1	.4
	House wife	155	65.1
	Total	229	96.2
Not responded		9	3.8
Total		238	100.0

20 percent of the group belongs to government employees 8 percent private, 2.9 percent business and the major share of the mother's belongs to house wife category 65 percent.

Table 4.25
Income group of the parental family

Income group	Frequency	Percent
Low	8	3.4
Middle	228	95.8
High`	2	.8
Total	238	100.0

95.8 percent of the IT professionals family belongs to middle class, where as 3.4 percent are from low and 0.8 percent are high income group.

Table 4.26
Decision Making Attributes Related to Family Life

Decision Making Attributes		Sex		
		Female	Male	Total
Selecting spouse	Yes	92.9%	98.8%	95.0%
	No	7.1%	1.3%	5.0%
Total		100.0%	100.0%	100.0%
Number of kids	Yes	95.1%	94.4%	94.8%
	No	4.9%	5.6%	5.2%
Total		100.0%	100.0%	100.0%
Age gap of kids	Yes	96.6%	97.0%	96.7%
	No	3.4%	3.0%	3.3%
Total		100.0%	100.0%	100.0%
kids				
	No	3.4%	3.2%	3.3%
Total		100.0%	100.0%	100.0%

In the decision making attributes related to family life we have observed five variables, selecting spouse, deciding the number of kids, the age gap of kids and schooling of kids. Out of these 92.9% of females have hold in selecting their spouse and 98.8% of males do. In the decision making of number of kids 95.1% of females and 94.4% of males is part of it, in deciding the age gap 96.6% of females and 97.0% of males holds a role. In the case of schooling of kids 96.6% and 96.8% of females and males do hold a significant role in the decision making process. Overall the data shows that unlike in the general case of women's insignificant role in the decision making of their own personal

and family life, here in the case of female IT professionals they do a good percent holds a significant role in the decision making process related to their personal and family life.

Table 4.27

Decision Making Attributes Related to Spending Income

		Female	**Male**	
Regular Purchase	**Yes**	**88.8%**	**97.5%**	**92.0%**
	No	11.2%	2.5%	8.0%
Spending your income	Yes	94.9%	97.5%	95.9%
	No	5.1%	2.5%	4.1%

In the case of spending income how the role differs among gender is again interesting, being included in the category of high income group only 88.8% of the females do have a hold in the regular purchasing decisions, where as in the case of spending decisions of their own income 94.9% do have a hold.

Table 4.28
Decision Making Attributes Related to Social Life

		Female	Male	
Visit Friends & Relatives	Yes	92.4%	96.6%	94.0%
	No	7.6%	3.4%	6.0%
Total		100.0%	100.0%	100.0%

Spending holidays	Yes	91.6%	95.6%	93.1%
	No	8.4%	4.4%	6.9%
Total		100.0%	100.0%	100.0%

In the case of decisions related to social life, like visiting friends and relatives females 7.6% of them don't have any role where as 92.4% of the females do have a hold in such decisions. In spending the leisure time 6.9% still don't have a role to act on it where as the rest 93.1% do have. Spending holidays is the other parameter where 8.4% don't have a hold in the decision where as 91.6% have. At the same time in all these three cases we can't say there is significant difference as far as gender is considered where it is evident that females still took a back seat on deciding on all these basic parameters pertaining to their life.

Table 4.29
Distribution related to Obtaining health care for self

Obtaining health care for self		Sex		
		Female	Male	Total
	Yes	93.7%	100.0%	96.1%
	No	6.3%		3.9%
	Total	100.0%	100.0%	100.0%
Pearson Chi-Square :5.699[a]		Significant at 5% level		

In the case of obtaining health for self 6.3% of women don't have any hold where as 100% of the males do have a hold on deciding on their own health matters. The Chi-square analysis shows that there is significant difference in the case of gender still in this highly educated, heavily paid category of employees.

Table 4.31

Distribution related to Entrusting Monthly income with your spouse

Sex			Entrusting monthly income with your spouse		Total
			Yes	No	
	Female	% within Sex	90.5%	9.5%	100.0%
		% within Entrusting mothly income with your spouse	65.5%	50.0%	63.6%
	Male	% within Sex	83.3%	16.7%	100.0%
		% within Entrusting mothly income with your spouse	34.5%	50.0%	36.4%
Total		% within Sex	87.9%	12.1%	100.0%
		% within Entrusting mothly income with your spouse	100.0%	100.0%	100.0%

In the case of entrusting income with your spouse 90.5% of females do entrust where as 9.5% doesn't, where as 16.7% of males don't entrust their income where as 83.3% do entrust. Out of the total respondents it is females who are having more shares, 65.5% who are entrusting at the same time 34.5% of the males do. In the case of respondents who don't entrust it 50.0% of each gender.

Table 4.32

Gender and Decision making Sex ownership of house

		Decision making Sex ownership of house				
		Self	Spouse	Joint	Others	Total
Sex	Female	31.7%	100.0%	60.9%	75.9%	57.7%
	Male	68.3%		39.1%	24.1%	42.3%
Total		100.0%	100.0%	100.0%	100.0%	100.0%
Pearson Chi-Square :5.699[a] Significant at 5% level						
Note: Figures in parentheses are percentages Source: Survey						

It is evident from the table that only 31.7% of females in the self category and 60.9% of the females in the joint category are taking part in the decision making process. Where as 68.3% of males in the self category and and 39.1% in the joint category are part of the decision making process. Out of the joint category the major share have taken by females who are ready take decisions with their spouse. In the chi-square analysis there is a significant relationship between gender and decision making in the ownership of house.

Table 4.33
Gender and Ownership of House

		Ownership of House					Total
		Self	Spouse	Joint	Parents	In-laws	
Sex	Female	38.7%	100.0%	55.6%	66.7%	66.7%	55.8%
	Male	61.3%		44.4%	33.3%	33.3%	44.2%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Pearson Chi-Square :5.699[a] Significant at 10% level

Note: Figures in parentheses are percentages

Source: Survey

It is evident from the table that only 38.7% of females in the self category and 66.7% of the females in the joint category have ownership of house. Where as only 61.3% of males in the self category and and 44.4% in the joint category are part of the decision making process. Out of the joint category the major share have taken by females who are ready to share ownership with their spouse. There is significant relationship between gender and ownership of house. It is shown in the table that males are taking lead roles and many a times autonomy in the decision making and ownership process related to the purchase of house.

Table 4.34
Gender and Decision Making in purchase of vehicles

		Decision Making in purchase of vehicles				
		Self	Spouse	Joint	Others	Total
Sex	Female	26.9%	96.2%	87.5%	83.3%	53.1%
	Male	73.1%	3.8%	12.5%	16.7%	46.9%
Total		100.0%	100.0%	100.0%	100.0%	100.0%
Pearson Chi-Square :10.699[a] Significant at 5% level						
Note: Figures in parentheses are percentages Source: Survey						

It is evident from the table that only 26.9% of females in the self category and 87.5% of the females in the joint category are taking part in the decision making process. Where as 73.1% of males in the self category and and 12.5% in the joint category are part of the decision making process. Out of the joint category the major share have taken by females who are ready take decisions with their spouse. In the chi-square analysis there is a significant relationship between gender and decision making in the ownership of Vehicles. It is shown in the table that males still are taking lead roles and many a times autonomy in the decision making process.

Table 4.35
Gender and Ownership of vehicles

		Ownership of vehicles					Total
		Self	Spouse	Joint	Parents	In-laws	
Sex	Female	30.4%	92.9%	64.3%	61.1%	100.0%	53.3%
	Male	69.6%	7.1%	35.7%	38.9%		46.7%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Pearson Chi-Square :8.699[a] Significant at 5% level

Note: Figures in parentheses are percentages

Source: Survey

It is evident from the table that only 30.4% of females in the self category and 643% of the females in the joint category have ownership of house. Whereas only 69.6% of males in the self category and 35.7% in the joint category are having the ownership of Vehicles. Out of the joint category the major share have taken by females who are ready to share ownership with their spouse. There is significant relationship between gender and ownership of vehicles. It is shown in the table that males are taking lead roles and many a times autonomy in the decision making and ownership process related to the purchase of vehicles.

Table 4.36

Gender and Decision Making in Purchase of land

		Purchase of land				
		Self	Spouse	Joint	Others	Total
Sex	Female	61.1%	83.3%	57.9%	70.0%	64.2%
	Male	38.9%	16.7%	42.1%	30.0%	35.8%
Total		100.0%	100.0%	100.0%	100.0%	100.0%
Pearson Chi-Square :6.699[a]						
Note: Figures in parentheses are percentages Source: Survey						

It is evident from the table that only 61.1% of females in the self category and 57.9% of the females in the joint category are taking part in the decision making process. Whereas only 38.9% of males in the self category and 42.1% in the joint category are part of the decision making process. Out of the joint category the major share have taken by females who are ready take decisions with their spouse. In the chi-square analysis there is no a significant relationship between gender and decision making in the ownership of land. It is shown in the table that males aren't taking lead roles and many a times autonomy in the decision making process related to the purchase of land.

Table 4.37

Gender and Ownership of land

		Ownership of land					Total
		Self	Spouse	Joint	Parents	In-laws	
Sex	Female	50.0%	100.0%	68.0%	56.3%	66.7%	62.3%
	Male	50.0%		32.0%	43.8%	33.3%	37.7%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

It is evident from the table that only 50.0% of females in the self category and 68.0% of the females in the joint category have ownership of land. Whereas only 50.0% of males in the self category and 32.0% in the joint category are having the ownership of land. Out of the joint category the major share have taken by females who are ready to share ownership with their spouse. There is no significant relationship between gender and ownership of vehicles. It is shown in the table that males aren't taking lead roles and many a times autonomy in the decision making and ownership process related to the purchase of land.

Table 4.38

Gender and Ownership of Savings

		Ownership of Savings					Total
		Self	Spouse	Joint	Parents	In-laws	
Sex	Female	60.8%	100.0%	57.6%	80.0%	100.0%	62.5%
	Male	39.2%		42.4%	20.0%		37.5%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

It is evident from the table that only 60.8% of females in the self category and 57.6% of the females in the joint category have ownership of land. Whereas only 39.2% of males in the self category and 42.4% in the joint category are having the ownership of savings. Out of the joint category the major share have taken by females who are ready to share ownership with their spouse. There is significant relationship between gender and ownership of savings. It is shown in the table that males aren’t taking lead roles and many a times autonomy in the decision making and ownership process related to the purchase of savings.

Table 4.39

Gender and Decision making in the purchase of savings

		Decision making in the purchase of savings				
		Self	Spouse	Joint	Others	Total
Sex	Female	62.6%	100.0%	62.5%		63.6%
	Male	37.4%		37.5%	100.0%	36.4%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

It is evident from the table that only 62.6% of females in the self category and 62.5% of the females in the joint category are taking part in the decision making process. Whereas only 37.4% of males in the self category and and 37.5% in the joint category are part of the decision making process. Out of the joint category the major share have taken by females who are ready take decisions with their spouse. There is no a significant relationship between gender and decision making in the ownership of savings. It is shown in the table that males aren’t taking lead roles in the decision making process related to the purchase of savings.

Table 4.40

Gender and ownership of Insurance schemes

		Ownership of Insurance schemes					Total
		Self	Spouse	Joint	Parents	In-laws	
Sex	Female	59.2%	66.7%	63.6%	57.1%	100.0%	60.4%
	Male	40.8%	33.3%	36.4%	42.9%		39.6%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

It is evident from the table that only 59.2% of females in the self category and 63.6% of the females in the joint category have ownership of Insurance scheme. Whereas only 40.8% of males in the self category and 36.4% in the joint category are having the Insurance scheme. Out of the joint category the major share have taken by females who are ready to share ownership with their spouse. There is no significant relationship between gender and ownership of Insurance scheme. It is shown in the table that males aren't taking lead roles and many a times autonomy in the decision making and ownership process related to the purchase of Insurance scheme.

Table 4.41

Gender and Decision making in the purchase of Insurance schemes

		Decision making in the purchase of Insurance Schemes				
		Self	Spouse	Joint	Others	Total
Sex	Female	54.5%	85.7%	57.1%	100.0%	61.2%
	Male	45.5%	14.3%	42.9%		38.8%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

It is evident from the table that only 54.5% of females in the self category and 57.1% of the females in the joint category are taking part in the decision making process. Where as only 45.5% of males in the self category and and 42.9% in the joint category are part of the decision making process. Out of the joint category the major share have taken by females who are ready take decisions with their spouse. There is no a significant relationship between gender and decision making in the ownership of Insurance scheme. It is shown in the table that males aren't taking lead roles and many a times autonomy in the decision making process related to the purchase of Insurance scheme.

Table 4.42

Gender and ownership of Stocks & Shares

		ownership of Stocks & Shares						
		Self	Spouse	Joint	Parents	In-laws	Kids	Total
Sex	Female	56.0%	50.0%	75.0%	42.9%	66.7%	100.0%	58.7%
	Male	44.0%	50.0%	25.0%	57.1%	33.3%		41.3%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

It is evident from the table that only 56.0% of females in the self category and 75.0% of the females in the joint category have ownership of Stocks and shares. Whereas only 44.0% of males in the self category and 25.0% in the joint category are having the Stocks and shares. Out of the joint category the major share have taken by females who are ready to share ownership with their spouse. There is no significant relationship between gender and ownership of Insurance scheme. It is shown in the table that males aren't taking lead roles and many a times autonomy in the decision making and ownership process related to the purchase of Stocks and shares.

Table 4.43

Gender and Decision making in the purchase of Insurance schemes

		Decision making in the purchase of Insurance schemes				
		Self	Spouse	Joint	Others	Total
Sex	Female	83.9%		62.5%	50.0%	65.0%
	Male	16.1%	100.0%	37.5%	50.0%	35.0%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

Pearson Chi-Square :8.699[a] Significant at 5% level

Note: Figures in parentheses are percentages

Source: Survey

It is evident from the table that only 83.9% of females in the self category and 62.5% of the females in the joint category are taking part in the decision making process. Where as only 16.1% of males in the self category and and 37.5% in the joint category are part of the decision making process. Out of the joint category the major share have taken by females who are ready take decisions with their spouse. There is significant relationship between gender and decision making in the ownership of Insurance scheme. It is shown in the table that males aren't taking lead roles and many a times autonomy in the decision making process related to the purchase of Insurance scheme.

Table 4.44
Gender and Ownership of Gold

		Ownership of Gold					Total
		Self	Spouse	Joint	Parents	In-laws	
Sex	Female	74.4%	9.1%	65.2%	56.3%	100.0%	61.5%
	Male	25.6%	90.9%	34.8%	43.8%		38.5%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

It is evident from the table that only 74.4% of females in the self category and 65.2% of the females in the joint category have ownership of Stocks and shares. Whereas only 25.6% of males in the self category and 34.8% in the joint category are having the ownership of Gold. Out of the joint category the major share have taken by females who are ready to share ownership with their spouse. There is significant relationship between gender and ownership of Gold. It is shown in the table that males aren't taking lead roles and many a times autonomy in the decision making and ownership process related to the purchase of Gold.

Table 4.45
Decision making and ownership pattern in house

Sex			ownership pattern in house					
			Self	Spouse	Joint	Parents	In-laws	Total
Female	Self	% Decision mkg	61.5%		23.1%	15.4%		100.0%
		% Ownership	66.7%		21.4%	10.5%		26.0%
	Spouse		16.7%	16.7%	66.7%			100.0%
			8.3%	33.3%	28.6%			12.0%
	Joint		10.0%	20.0%	60.0%	10.0%		100.0%
			8.3%	66.7%	42.9%	5.3%		20.0%
	Others		9.5%		4.8%	76.2%	9.5%	100.0%
			16.7%		7.1%	84.2%	100.0%	42.0%
	Total		24.0%	6.0%	28.0%	38.0%	4.0%	100.0%
			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Male	Self		68.0%		12.0%	16.0%	4.0%	100.0%
			89.5%		25.0%	57.1%	100.0%	64.1%
	Joint		11.1%		88.9%			100.0%
			5.3%		66.7%			23.1%
	Others		20.0%		20.0%	60.0%		100.0%
			5.3%		8.3%	42.9%		12.8%
	Total		48.7%		30.8%	17.9%	2.6%	100.0%
			100.0%		100.0%	100.0%	100.0%	100.0%

Table 4.46

Decision making and ownership pattern in vehicles

Sex			ownership pattern in house					
			Self	Spouse	Joint	Parents	In-laws	Total
Female	Self	% Decision mkg	61.5%		23.1%	15.4%		100.0%
		% Ownership	66.7%		21.4%	10.5%		26.0%
	Spouse		16.7%	16.7%	66.7%			100.0%
			8.3%	33.3%	28.6%			12.0%
	Joint		10.0%	20.0%	60.0%	10.0%		100.0%
			8.3%	66.7%	42.9%	5.3%		20.0%
	Others		9.5%		4.8%	76.2%	9.5%	100.0%
			16.7%		7.1%	84.2%	100.0%	42.0%
	Total		24.0%	6.0%	28.0%	38.0%	4.0%	100.0%
			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Male	Self		68.0%		12.0%	16.0%	4.0%	100.0%
			89.5%		25.0%	57.1%	100.0%	64.1%
	Joint		11.1%		88.9%			100.0%
			5.3%		66.7%			23.1%
	Others		20.0%		20.0%	60.0%		100.0%
			5.3%		8.3%	42.9%		12.8%
	Total		48.7%		30.8%	17.9%	2.6%	100.0%
			100.0%		100.0%	100.0%	100.0%	100.0%

Table 4.46

Decision making and ownership pattern in vehicles

Decision Making and Ownership of vehicles

Out of the self It is evident from the table that only 64.7% of females in the self category and 17.6% of the females in the joint category are taking part in the decision making process and ownership of vehicles together. Where as 68.9% of males in the self category and 17.8% in the joint category are part of the decision making process as well as ownership of vehicles. Out of the joint category the major share have taken by females who are ready take decisions with their spouse. There is significant relationship between decision making and ownership of vehicles. Out of the total ownership of females in the vehicles, 24.0% have self ownership and 31.5% have joint ownership. It is quite good sign when it is comparing with the general status of women in India as well as kerala. Freedom to travel is increasing by this way. There is a slight change in the ownership pattern of females among the IT Professionals. In the case of males 65.3% of self and 20.4% of joint ownership are in to their credits and again there is 2.2% men who have given the ownership of their vehicles to their spouse.

Table 4.47
Decision making and ownership pattern in savings

Sex				Ownership of savings				Total
				Self	Spouse	Joint	Parents	
Female	q40a	Self	% within q40a	83.0%		1.9%	15.1%	100.0%
			% within q40b	97.8%		5.6%	100.0%	72.6%
		Spouse	% within q40a		50.0%	50.0%		100.0%
			% within q40b		50.0%	5.6%		2.7%
		Joint	% within q40a	5.6%	5.6%	88.9%		100.0%
			% within q40b	2.2%	50.0%	88.9%		24.7%
	Total		% within q40a	61.6%	2.7%	24.7%	11.0%	100.0%
			% within q40b	100.0%	100.0%	100.0%	100.0%	100.0%
Male	q40a	Self	% within q40a	88.0%		8.0%	4.0%	100.0%
			% within q40b	88.0%		15.4%	50.0%	62.5%
		Spouse	% within q40a	100.0%				100.0%
			% within q40b	4.0%				2.5%
		Joint	% within q40a	15.4%		84.6%		100.0%
			% within q40b	8.0%		84.6%		32.5%
		Others	% within q40a				100.0%	100.0%
			% within q40b				50.0%	2.5%
	Total		% within q40a	62.5%		32.5%	5.0%	100.0%
			% within q40b	100.0%		100.0%	100.0%	100.0%

Decision Making and Ownership of Savings

Out of the self It is evident from the table that only 83.0% of females in the self category and 1.0% of the females in the joint category are taking part in the decision making process and ownership of savings together. Where as 88.0% of males in the self category and 8.0% in the joint category are part of the decision making process as well as ownership of savings. Out of the joint category the major share have taken by males who wanted have savings og their spouse’s also. There is significant relationship between decision making and ownership of savings. Out of the total ownership of females in the savings, 61.6% have self ownership and 24.7% have joint ownership. It is quite good sign when it is comparing with the general status of women in India as well as kerala. Total savings is increasing by this way. There is a slight change in the ownership pattern of females among the IT Professionals. In the case of males 62.5% of self and 32.5% of joint ownership are in to their credits and again there is no men who have given the ownership of their savings to their spouse.

Table 4.47

Decision making of ownership of insurance schemes

Sex				ownership of insurance schemes				Total
				Self	Spouse	Joint	Parents	
Female	q41a	Self	% within q41a	76.5%		7.8%	15.7%	100.0%
			% within q41b	97.5%		28.6%	100.0%	79.7%
		Spouse	% within q41a	25.0%	50.0%	25.0%		100.0%
			% within q41b	2.5%	100.0%	7.1%		6.3%
		Joint	% within q41a			100.0%		100.0%
			% within q41b			64.3%		14.1%
	Total		% within q41a	62.5%	3.1%	21.9%	12.5%	100.0%
			% within q41b	100.0%	100.0%	100.0%	100.0%	100.0%
Male	q41a	Self	% within q41a	89.3%		3.6%	7.1%	100.0%
			% within q41b	96.2%		14.3%	50.0%	73.7%
		Joint	% within q41a	11.1%	11.1%	66.7%	11.1%	100.0%
			% within q41b	3.8%	100.0%	85.7%	25.0%	23.7%
		Others	% within q41a				100.0%	100.0%
			% within q41b				25.0%	2.6%
	Total		% within q41a	68.4%	2.6%	18.4%	10.5%	100.0%
			% within q41b	100.0%	100.0%	100.0%	100.0%	100.0%

Decision Making and Ownership of Insurance Scheme

Out of the self It is evident from the table that only 76.8% of females in the self category and 7.8% of the females in the joint category are taking part in the decision making process and ownership of Insurance Scheme together. Whereas 89.0% of males in the self category and 3.6% in the joint category are part of the decision making process as well as ownership of Insurance Scheme. Out of the joint category the major share have taken by males who wanted have savings their spouse's also. There is no significant relationship between decision making and ownership of Insurance Scheme. Out of the total ownership of females in the savings, 62.6% have self ownership and 21.9% have joint ownership. It is quite good sign when it is comparing with the general status of women in India as well as kerala. Total savings is increasing by this way. There is a slight change in the ownership pattern of females among the IT Professionals. In the case of males 68.4% of self and 18.4% of joint ownership are in to their credits and again there is 2.6% men who have given the ownership of their Insurance Scheme to their spouse.

Table 4.48

Decision making of ownership of stocks and shares

Sex				Ownership of stocks and shares						Total
				Self	Spouse	Joint	Parents	In-laws	Kids	
Female	q42a	Self	% within q42a	70.6%		11.8%	17.6%			100.0%
			% within q42b	92.3%		33.3%	100.0%			68.0%
		Spouse	% within q42a		33.3%	33.3%		33.3%		100.0%
			% within q42b		100.0%	16.7%		100.0%		12.0%
		Joint	% within q42a			100.0%				100.0%
			% within q42b			50.0%				12.0%
		Others	% within q42a	50.0%					50.0%	100.0%
			% within q42b	7.7%					100.0%	8.0%
	Total		% within q42a	52.0%	4.0%	24.0%	12.0%	4.0%	4.0%	100.0%
			% within q42b	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Male	q42a	Self	% within q42a	83.3%			8.3%	8.3%		100.0%
			% within q42b	90.9%			100.0%	100.0%		75.0%
		Spouse	% within q42a		100.0%					100.0%
			% within q42b		100.0%					6.3%
		Joint	% within q42a	33.3%		66.7%				100.0%
			% within q42b	9.1%		100.0%				18.8%
	Total		% within q42a	68.8%	6.3%	12.5%	6.3%	6.3%		100.0%
			% within q42b	100.0%	100.0%	100.0%	100.0%	100.0%		100.0%

Decision Making and Ownership of Stocks & shares

Out of the self it is evident from the table that only 70.6% of females in the self category and 17.6% of the females in the joint category are taking part in the decision making process and ownership of Stocks & Shares together. Whereas 83.3% of males in the self category is part of the decision making process as well as ownership of Stocks & Shares**.** Out of the joint category the major share males have nothing in the joint account. There is no significant relationship between decision making and ownership of Insurance Scheme. Out of the total ownership of females in the Stocks & Shares, 52.0% have self ownership and 24.0% have joint ownership. It is quite good sign when it is comparing with the general status of women in India as well as kerala. Total savings is increasing by this way. There is a good change in the ownership pattern of females among the IT Professionals. In the case of males 68.4% of self and 12.5% of joint ownership are in to their credits and again there is 6.3% men who have given the ownership of their Insurance Scheme to their spouse.

Table 4.49

Gender and Monthly Savings

		Monthly Savings		
		Yes	No	Total
Sex	Female	63.3%	42.9%	61.2%
	Male	36.7%	57.1%	38.8%
Total		100.0%	100.0%	100.0%

From the table it is shown that females are having highest share of savings where more of men are not showing up for savings. From the data 63.3% of females are saving their income.

Table 4.50

Gender and Monthly Loans

		Monthly Loans		
		Yes	No	Total
Sex	Female	54.2%	69.1%	62.2%
	Male	45.8%	30.9%	37.8%
Total		100.0%	100.0%	100.0%

Table 4.51

Hypothesis Test: Independent Groups (t-test, pooled variance)

Female Savings	Male Savings	
16,535.09	13,257.58	mean
12,900.70	8,343.23	std. dev.
114	66	n

From the t –Test it is evident that there is no significant relationship between males savings and females savings.

Table 4.52

Hypothesis Test: Independent Groups (t-test, pooled variance)

Female Loans	Male Loans	
23,068.18	14,324.32	mean
13,083.63	8,673.25	std. dev.
44	37	n

There is significant relationship between the two groups tested over here ,loans of females as well as males. The P value is highly significant that shows the high significant relationship between the two groups.

Table 4.53

Distribution related to the designations of the respondents

			designations of the respondents								Total
			Software engineer	Senior Software engineer	Trainees	Developers and programmers	Technical leads and analysts	Managers	Others	Not responded	
Sex	Female	% within Sex	34.0%	13.6%	6.8%	15.0%	11.6%	4.1%	.7%	14.3%	100.0%
			59.5%	55.6%	66.7%	68.8%	51.5%	66.7%	33.3%	80.8%	61.8%
	Male	% within Sex	37.4%	17.6%	5.5%	11.0%	17.6%	3.3%	2.2%	5.5%	100.0%
			40.5%	44.4%	33.3%	31.3%	48.5%	33.3%	66.7%	19.2%	38.2%
Total		% within Sex	35.3%	15.1%	6.3%	13.4%	13.9%	3.8%	1.3%	10.9%	100.0%
			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Out of the total respondents 35.3% are software engineers, 15.1% are Senior software engineers, 6.3% are trainees, 13.4% are developers and programmers, 13.9% are Technical leads and analysts, 3.8% are managers, 10% haven’t responded. There is no significant relationship between gender and the designations are concerned as far as the employees in the initial years of their career.

Table 4.54

Distribution related to the position in the management level

Sex			Management level		
			Middle management	Not Applicable	Total
	Female	% within Sex	13.5%	86.5%	100.0%
		% within q56	55.6%	64.0%	62.4%
	Male	% within Sex	17.9%	80.6%	100.0%
		% within q56	44.4%	36.0%	37.6%
Total		% within Sex	15.2%	84.3%	100.0%
		% within q56	100.0%	100.0%	100.0%
Pearson Chi-Square: 2.361[a]					

In the case of the position in the management level 15.2% are in the middle management level and rest are not. It is very evident that there is no respondent belongs to the top management position. There is no significant relationship between gender and the position in the management.

Table 4.55

Distribution of number of technical trainings attended in a year

Number of Technical Trainings	Percent
0-2	57.2
3-5	31.0
6-8	1.4
9-12	9.0
More than 20	1.3

57.2 percent of the respondents attended 0-2 trainings in a year, where as 31 percent undergone 3-5 trainings and 6-8 and 9-12 number of trainings were undergone by 9.0 percent and 1.3%.

Table 4.56

Distribution of number of soft skills trainings attended in a year

Number of Soft skills Trainings	Percent
0-2	82.5
3-5	13.0
6-10	5.0

In the case of soft skills trainings 82.5% of the IT professionals have gone through a minimum of 0-2 number of trainings,13.0% of the total respondents done 3-5 trainings and 5% undergone 6-10 trainings in a year

Table 4.57

Distribution related to the trainings and competency

			trainings and competency					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	23.1%	11.9%	52.4%	9.8%	2.8%	100.0%
		% within q60	58.9%	54.8%	64.7%	63.6%	66.7%	61.9%
	Male	% within Sex	26.1%	15.9%	46.6%	9.1%	2.3%	100.0%
		% within q60	41.1%	45.2%	35.3%	36.4%	33.3%	38.1%
Total		% within Sex	24.2%	13.4%	50.2%	9.5%	2.6%	100.0%
		% within q60	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

As the respondents are under going too much trainings in a year here we checked how good the trainings are in developing competency in the IT professionals. It is evident from the table that 58.9% of females confirmed that they are always getting more competent, were as 41.1% of the males do. Where as 34% of the females and 41% of the males are getting competency almost in all trainings. 12.6% and 11.4% responded that they are not upgrading with trainings. In the chi-square analysis there is no significant relationship between gender and competency in trainings.

Table 4.58

Distribution related to favourable aptitudes to computers & Software

			aptitudes to computers & Software					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	34.5%	28.9%	26.1%	9.2%	1.4%	100.0%
		% within q61	63.6%	50.6%	72.5%	68.4%	50.0%	61.2%
	Male	% within Sex	31.1%	44.4%	15.6%	6.7%	2.2%	100.0%
		% within q61	36.4%	49.4%	27.5%	31.6%	50.0%	38.8%
Total		% within Sex	33.2%	34.9%	22.0%	8.2%	1.7%	100.0%
		% within q61	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

It is always being allegated that women are having less aptitudes to computers and software. The study gives evidence that women are showing more aptitudes to computers and softwares with 34.5% and 28.9% responded that they always and very frequently found themselves good aptitudes where as 31.1% and 44.4% responded from the male category. 26.1% of females and 15.6% of males confirmed that they found themselves with the aptitudes sometimes. Out of the total respondents 10.6% and 9.9% of females and males found that don’t have aptitude to computers and software. In the chi-square analysis it is found that there is no significant relationship between gender and favourable aptitudes to computers and software.

Table 4.59

Distribution related to the multitasking at work

			multitasking at work					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	14.5%	25.5%	40.7%	15.9%	3.4%	100.0%
		% within q62	55.3%	66.1%	57.3%	74.2%	71.4%	61.7%
	Male	% within Sex	18.9%	21.1%	48.9%	8.9%	2.2%	100.0%
		% within q62	44.7%	33.9%	42.7%	25.8%	28.6%	38.3%
Total		% within Sex	16.2%	23.8%	43.8%	13.2%	3.0%	100.0%
		% within q62	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The studies have shown that software industry employees are very much stressed and doing multitasking at work. The survey found that 40% of the respondents from each category assigned multitasking at work. Where as 19.3% and 11.1% of females and males are not getting multitasking at work. 40.7% of the females and 42.7% of the males are getting multitasking at work sometimes. But there is no significant relationship between gender and multitasking at work.

Table 4.60

Distribution related to emotional depletion at work

			emotional depletion at work					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	2.8%	12.7%	42.3%	21.8%	20.4%	100.0%
		% within q63	66.7%	66.7%	61.9%	52.5%	69.0%	61.5%
	Male	% within Sex	2.2%	10.1%	41.6%	31.5%	14.6%	100.0%
		% within q63	33.3%	33.3%	38.1%	47.5%	31.0%	38.5%
Total		% within Sex	2.6%	11.7%	42.0%	25.5%	18.2%	100.0%
		% within q63	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Employees found themselves emotionally depleted at work is a very common phenomenon in the corporate world. The study found that 14.9% of females and 12.3% of the males agreed that they are emotionally depleted at work always. 42.2% of females and 46.1% of males are not emotionally depleted at work. But 42.3% females and 41.6% of males are emotionally depleted sometimes at work. But the chi-square analysis shown that there is no significant relationship between gender and emotional depletion at work.

Table 4.61

Distribution related to promotions at work

			Promotions at work					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	9.2%	17.6%	38.2%	19.8%	15.3%	100.0%
		% within q64	63.2%	50.0%	58.1%	70.3%	74.1%	60.9%
	Male	% within Sex	8.3%	27.4%	42.9%	13.1%	8.3%	100.0%
		% within q64	36.8%	50.0%	41.9%	29.7%	25.9%	39.1%
Total		% within Sex	8.8%	21.4%	40.0%	17.2%	12.6%	100.0%
		% within q64	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Gender and promotions at work, the study observed that 9.2% females and 8.3% males are getting promotion as it required. 17.6% of females and 27.4% of males are getting promotions. 35.1% of females and 21.4% of males responded that they are not getting promotions at all. But still the chi-square analysis shown that there is no significant relationship between gender and promotions at work.

Table 4.62

Distribution related to the Software production modules

			YES	NO	
Sex	Female	% within Sex	43.1%	49.6%	100.0%
		% within q65	56.7%	63.0%	61.4%
	Male	% within Sex	52.3%	46.5%	100.0%
		% within q65	43.3%	37.0%	38.6%
Total		% within Sex	46.6%	48.4%	100.0%
		% within q65	100.0%	100.0%	100.0%

It is highly argued by the academicians that software productions are very much fragmented. It is found that 56.9% of females responded that there is no such fragmentation in the work process, where as 43.1% agreed that fragmentation do exist in the industry. In the case of males 52.3% agreed that fragmentation exists and 46.5% disagreed. The chi-square analysis found that there is no significant relationship between gender and the work process.

Table 4.63

Distribution related to the salary of respondents

			Related to salary		
			Yes	No	Total
Sex	Female	% within Sex	61.2%	38.8%	100.0%
		% within q66	59.0%	66.7%	61.8%
	Male	% within Sex	68.6%	31.4%	100.0%
		% within q66	41.0%	33.3%	38.2%
Total		% within Sex	64.0%	36.0%	100.0%
		% within q66	100.0%	100.0%	100.0%

Differential in salary is a very common phenomenon in the unorganized sector. Here in the study it is observed that 38.8% of females agreed that they don't have salary in par with their male counter parts, where as 61.2% of the females agreed with it. In the case of male respondents 68.6% agreed that they are getting salary in par. But the chi-square relationship shown that there is no significant relationship between the gender and salary of respondents.

Table 4.64

Distribution related to the promotion at work

			promotion at work		
			Yes	No	Total
Sex	Female	% within Sex	71.7%	28.3%	100.0%
		% within q67	60.0%	67.2%	61.9%
	Male	% within Sex	77.6%	22.4%	100.0%
		% within q67	40.0%	32.8%	38.1%
Total		% within Sex	74.0%	26.0%	100.0%
		% within q67	100.0%	100.0%	100.0%

Promotion in carrier is another attribute related to the work status. 28.3% of females confess that they are not getting promotions as it supposed to be, where as 22.4% of males agreed with it. 77.6% of males agreed that they are getting promotions as it is supposed to be. Where as 71.7% agreed with this. The chi-square analysis found that there is no significant relationship between gender and promotion at work.

Table 4.65

Distribution related to appreciation at work

			Appreciation at work		
			Yes	No	Total
Sex	Female	% within Sex	84.1%	15.9%	100.0%
		% within q69	60.0%	63.6%	60.6%
	Male	% within Sex	86.0%	14.0%	100.0%
		% within q69	40.0%	36.4%	39.4%
Total		% within Sex	84.9%	15.1%	100.0%
		% within q69	100.0%	100.0%	100.0%

Appreciation at work is a major parameter which decides the work status. In the study it is found that 16% of females doesn't have appreciation at work. Where as 14.0% males also agreed the same. 84.1% of females and 86.0% of male confirms that they are having appreciation at work. In the chi-square analysis it is found that there is no significant relationship between gender and appreciation at work.

Table 4.66

Distribution related to Creative contributions at work

			Creative contributions at work		
			Yes	No	Total
Sex	Female	% within Sex	78.7%	21.3%	100.0%
		% within q70	58.8%	76.3%	61.8%
	Male	% within Sex	89.3%	10.7%	100.0%
		% within q70	41.2%	23.7%	38.2%
Total		% within Sex	82.7%	17.3%	100.0%
		% within q70	100.0%	100.0%	100.0%

Work status also decided whether the employees creative contributions at work are including or not. 21.3% females responded that their creative contributions are not being considered. 17.3% males also agreed with this. 89.3% of males and 78.7% females are happy that their creative ideas are being used at work. In the chi-square analysis it is found that there is significant relationship between gender and creative contributions at work

Table 4.67

Distribution related to Work –Life tensions at work

			Work –Life tensions at work		
			Yes	No	Total
Sex	Female	% within Sex	54.9%	45.1%	100.0%
		% within q71	65.5%	58.2%	62.0%
	Male	% within Sex	47.1%	52.9%	100.0%
		% within q71	34.5%	41.8%	38.0%
Total		% within Sex	52.0%	48.0%	100.0%
		% within q71	100.0%	100.0%	100.0%

To know more about the stress at work, in the study it is observed how the Work-Life tensions is. It is found that 54.9% of females agreed that they do have Work-Life tensions, where as 47.1% of men agreed with it. 45.1% of females and 52.9% males confirmed that there is no Work-Life tensions affecting them. The chi-square analysis found that there is no significant relationship between gender and Work-Life tension at work.

Table 4.68

Gender and Professional incentives

			Professional incentives					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	18.7%	20.1%	38.8%	17.9%	4.5%	100.0%
		% within q72	59.5%	49.1%	70.3%	70.6%	50.0%	61.8%
	Male	% within Sex	20.5%	33.7%	26.5%	12.0%	7.2%	100.0%
		% within q72	40.5%	50.9%	29.7%	29.4%	50.0%	38.2%
Total		% within Sex	19.4%	25.3%	34.1%	15.7%	5.5%	100.0%
		% within q72	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Another important parameter which decides the satisfaction at work and work status is professional incentives. It is found that 18.7% of females and 20.5% males agreed that they are getting professional incentives.33.7% of males found that they are getting professional incentives very frequently, where as 20.1% females do agree. 22.4% of females confirmed that they are not getting professional incentives. Where as 19.2% of males do agree. But the chi-square analysis found that there is no significant relationship between gender and professional incentives.

Table 4.69

Distribution related to Decisions at Work

			Decisions at Work					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	13.3%	21.0%	40.6%	21.0%	3.5%	100.0%
		% within q73	57.6%	65.2%	62.4%	58.8%	71.4%	61.9%
	Male	% within Sex	15.9%	18.2%	39.8%	23.9%	2.3%	100.0%
		% within q73	42.4%	34.8%	37.6%	41.2%	28.6%	38.1%
Total		% within Sex	14.3%	19.9%	40.3%	22.1%	3.0%	100.0%
		% within q73	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Work status and decisions at work are highly correlated. It is found in the study that 34.4% of females and 34.1% of males agreed that they are part of decisions at work. Where as 65.1% of females and 61.0% of males found that they are not related to decisions at work. In the chi-square analysis it is found that there is no significant relationship between gender and decisions at work.

Table 4.70

Distribution related to Stress at work

			Stress at work					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	8.4%	17.5%	44.8%	25.9%	3.5%	100.0%
		% within q74	75.0%	69.4%	61.5%	56.9%	55.6%	62.2%
	Male	% within Sex	4.6%	12.6%	46.0%	32.2%	4.6%	100.0%
		% within q74	25.0%	30.6%	38.5%	43.1%	44.4%	37.8%
Total		% within Sex	7.0%	15.7%	45.2%	28.3%	3.9%	100.0%
		% within q74	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Stress at work is an important attribute to look at the job satisfaction, work status, stress and quality of a person's life. 25.9% of females agreed that they have stress at work where as 17.2% of males confirmed it. 29.4% of females and 36.85 of males respond that they don't have stress at work. Where as 44.8% and 46.0% of females and males agreed that they have stress at sometimes. The chi-square analysis confirmed that there is no significant relationship between gender and stress at work.

Table 4.71

Distribution related to Stress in family

			Stress in family					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	5.0%	11.3%	34.8%	31.9%	17.0%	100.0%
		% within q75	58.3%	64.0%	68.1%	54.9%	66.7%	62.1%
	Male	% within Sex	5.8%	10.5%	26.7%	43.0%	14.0%	100.0%
		% within q75	41.7%	36.0%	31.9%	45.1%	33.3%	37.9%
Total		% within Sex	5.3%	11.0%	31.7%	36.1%	15.9%	100.0%
		% within q75	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Stress in work affect the family and again stress in the family affect stress at work. It is found in the study that 16.3% of females do have stress where as equal percent of males do. 48.9% females and 54.0% of males agreed that they don't have stress at all, where as 34.8% and 26.7% of females have stress in family sometimes. But in the chi-square analysis it is found that there is no significant relationship between gender and stress in family.

Table 4.72

Distribution related to daily stress

			Daily stress					
			Yes	No	3	4	5	Total
Sex	Female	% within Sex	17.6%	73.2%	2.8%	4.2%	2.1%	100.0%
		% within q76	58.1%	60.1%	66.7%	100.0%	75.0%	61.2%
	Male	% within Sex	20.0%	76.7%	2.2%		1.1%	100.0%
		% within q76	41.9%	39.9%	33.3%		25.0%	38.8%
Total		% within Sex	18.5%	74.6%	2.6%	2.6%	1.7%	100.0%
		% within q76	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Daily stress is the cumulative effect of stress in family and stress at work. 17.6% of females and 20.0% of males agreed that they do have stress in a daily basis where as 82.2% of females and 79.7% of males respond that they don't have stress on a daily basis. The chi-square analysis found that there is no significant relationship between gender and daily stress.

Table 4.73

Distribution related display of anger

			Display of anger		
			Yes	No	Total
Sex	Female	% within Sex	52.4%	47.6%	100.0%
		% within q77	73.8%	52.7%	61.7%
	Male	% within Sex	30.0%	68.9%	100.0%
		% within q77	26.2%	47.3%	38.3%
Total		% within Sex	43.8%	55.7%	100.0%
		% within q77	100.0%	100.0%	100.0%

In the case of display of anger how do men and women differ that is analysed in this question. 47.6% of females and 69.9% of males responded that they won't display anger. Where as 52.4% of females and 30.0% of males agreed that they do display anger. In the chi-square analysis it is found that there is significant relationship between gender and display of anger.

Table 4.74

Distribution related to additional job

			Additional job		
			Yes	No	Total
Sex	Female	% within Sex	17.4%	82.6%	100.0%
		% within q78	53.2%	63.6%	61.5%
	Male	% within Sex	24.4%	75.6%	100.0%
		% within q78	46.8%	36.4%	38.5%
Total		% within Sex	20.1%	79.9%	100.0%
		% within q78	100.0%	100.0%	100.0%

To understand the nature of the employees, to check the work-holic attitude, it is helpful to know whether they are doing any additional job. 82.6% of females and 75.6% males responded that they are not doing any additional job, where as 17.4% of females and 24.4% males do have additional jobs.

Table 4.75

Distribution on job quit of family commitments

			Quitting Job		
			Yes	No	Total
Sex	Female	% within Sex	27.3%	72.7%	100.0%
		% within q79	52.7%	65.8%	61.6%
	Male	% within Sex	39.3%	60.7%	100.0%
		% within q79	47.3%	34.2%	38.4%
Total		% within Sex	31.9%	68.1%	100.0%
		% within q79	100.0%	100.0%	100.0%

To check how the family commitments and quitting a job relates, if is found that. 72.7% of females and 60.7% of males agrees that they haven't quit job for family commitments where as 27.3% of females and 39.3% of males quit jobs for family. The chi-square analysis found that there is significant relationship between gender and job quit for family commitments.

Table 4.76

Distribution related to Job Satisfaction

			Job Satisfaction		
			Yes	No	Total
Sex	Female	% within Sex	79.5%	20.5%	100.0%
		% within q80	62.0%	63.8%	62.4%
	Male	% within Sex	80.7%	19.3%	100.0%
		% within q80	38.0%	36.2%	37.6%
Total		% within Sex	79.9%	20.1%	100.0%
		% within q80	100.0%	100.0%	100.0%

It is found that 20.5% females and 19.3% male don’t have job satisfaction where as 79.5% and 80.7% of females and males have job satisfaction. In chi-square analysis there is no significant relationship between gender and job satisfaction.

Table 4.77

Distribution related Job insecurity

			Job insecurity		
			Yes	No	Total
Sex	Female	% within Sex	36.2%	63.8%	100.0%
		% within q81	60.0%	65.7%	63.5%
	Male	% within Sex	42.0%	58.0%	100.0%
		% within q81	40.0%	34.3%	36.5%
Total		% within Sex	38.3%	61.7%	100.0%
		% within q81	100.0%	100.0%	100.0%

In the case of job insecurity 36.2% females and 42.0% males have job insecurity where as 63.8% of females and 58.0% males do have job insecurity. In the chi-square analysis there is no significant relationship between job insecurity and gender.

Table 4.78
Distribution related to mode of travel to work

			Mode of travel to work						
			Own vehicle	Company cab	Rented	Public transportation	Partner will drop	With friends	Total
Sex	Female	% within Sex	24.8%	41.6%	1.6%	17.6%	6.4%	8.0%	100.0%
		% within q82	45.6%	74.3%	100.0%	71.0%	88.9%	76.9%	64.8%
	Male	% within Sex	54.4%	26.5%		13.2%	1.5%	4.4%	100.0%
		% within q82	54.4%	25.7%		29.0%	11.1%	23.1%	35.2%
Total		% within Sex	35.2%	36.3%	1.0%	16.1%	4.7%	6.7%	100.0%
		% within q82	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Mode of travel signifies the freedom to move. It is found that 41.6% and 17.6% of females use company cabs and public transportation, where as 24.8% of females are using on vehicles. 54.4% of males are using on vehicle and 26.5% and 13.2% are using company cabs and public transportation respectively. In the chi-square analysis it is found that there is significant relationship between gender and mode of travel.

Table 4.79

Distribution related to mode Personal Travel

			Mode of Personal Travel					
			Own vehicle	Rented	Public transportation	Partner will drop	With friends	Total
Sex	Female	% within Sex	61.1%	1.1%	24.2%	7.4%	6.3%	100.0%
		% within q83	59.8%	100.0%	65.7%	100.0%	100.0%	65.1%
	Male	% within Sex	76.5%		23.5%			100.0%
		% within q83	40.2%		34.3%			34.9%
Total		% within Sex	66.4%	.7%	24.0%	4.8%	4.1%	100.0%
		% within q83	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In the case of personal travel 61.1% of females and 76.5% of males use personal vehicles, the rest say 24.2% and 23.5% use public transportation as their mode of personal travel. But in the chi-square analysis there is no significant relationship between gender and mode of personal travel.

Table 4.80

Distribution related to flexible office hours

			Flexible office hours		
			Yes	No	Total
Sex	Female	% within Sex	86.9%	13.1%	100.0%
		% within q84a	64.6%	52.8%	62.8%
	Male	% within Sex	80.2%	19.8%	100.0%
		% within q84a	35.4%	47.2%	37.2%
Total		% within Sex	84.4%	15.6%	100.0%
		% within q84a	100.0%	100.0%	100.0%

In the case of flexible office hours 13.1% of females and 19.8% of males responded that they don't have flexibility in office hours. Where as 86.9% of females and 80.2% of males agreed with it. But it is found that there is no significant relationship between gender and flexibility in office hours.

Table 4.81
Distribution related to part time working facility

			Part time working facility		
			Yes	No	Total
Sex	Female	% within Sex	16.4%	83.6%	100.0%
		% within q84b	68.8%	60.9%	62.0%
	Male	% within Sex	12.2%	87.8%	100.0%
		% within q84b	31.3%	39.1%	38.0%
Total		% within Sex	14.8%	85.2%	100.0%
		% within q84b	100.0%	100.0%	100.0%

In the case of part time working facility 83.6% of females and 87.8% of males responded that they don't have part time working facility, where as 16.4% and 12.2% agreed that they do have. But in the chi-square analysis there is no significant relationship between gender and part time working facility.

Table 4.82
Distribution related to Working at home

			Working at home		
			Yes	No	Total
Sex	Female	% within Sex	27.0%	73.0%	100.0%
		% within q84c	61.7%	62.9%	62.6%
	Male	% within Sex	28.0%	72.0%	100.0%
		% within q84c	38.3%	37.1%	37.4%
Total		% within Sex	27.4%	72.6%	100.0%
		% within q84c	100.0%	100.0%	100.0%

73.0% of females and 72.0% of males responded that they don't have working at home facility. Where as 27.0% of females and 28.0% males do have. In the chi-square analysis there is no significant relationship between gender and working at home facility.

Table 4.83

Distribution related to adequate Maternity Leave

			Maternity Leave		
			Yes	No	Total
Sex	Female	% within Sex	72.3%	27.7%	100.0%
		% within q84d	85.3%	73.8%	81.8%
	Male	% within Sex	56.0%	44.0%	100.0%
		% within q84d	14.7%	26.2%	18.2%
Total		% within Sex	69.3%	30.7%	100.0%
		% within q84d	100.0%	100.0%	100.0%

27.7% of females and 44.0% of males responded that maternity leave is not adequate, where as 72.3% of females and 56.0% males are happy with the maternity leave facility.

Table 4.84

Distribution related to adequate paternity leave

			Paternity leave		
			Yes	No	Total
Sex	Female	% within Sex	63.2%	36.8%	100.0%
		% within q84e	57.3%	67.6%	60.7%
	Male	% within Sex	72.7%	27.3%	100.0%
		% within q84e	42.7%	32.4%	39.3%
Total		% within Sex	67.0%	33.0%	100.0%
		% within q84e	100.0%	100.0%	100.0%

In the case of paternity leave 36.8% of females and 27.3% of males are not happy with it where as 63.2% of females and 72.7% of males are contended with that they have.

Table 4.85

Gender and Timely health care to Oneself

			Timely health care to Oneself					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	19.2%	19.9%	45.9%	11.0%	4.1%	100.0 %
		% within q85	71.8%	64.4%	56.8%	57.1%	100.0%	61.9%
	Male	% within Sex	12.2%	17.8%	56.7%	13.3%		100.0 %
		% within q85	28.2%	35.6%	43.2%	42.9%		38.1%
Total		% within Sex	16.5%	19.1%	50.0%	11.9%	2.5%	100.0 %
		% within q85	100.0%	100.0%	100.0%	100.0%	100.0%	100.0 %

39.1% of females and 30.0% of males agreed that they don't take timely healthcare to themselves where as 11.1% females and 13.3% males occasionally did. Surprisingly 4.1% females never did any health care to themselves. 45.9% females and 56.7% males responded that they sometimes address their health care issue. There is no significant relationship in the chi-square analysis among gender and timely health care

Table 4.86

Gender and Timely health care to family

			Timely health care to family						Total
			Always	Very frequently	Sometimes	Occasionally	Never	6	
Sex	Female	% within Sex	25.5%	28.3%	35.2%	9.0%	1.4%	.7%	100.0%
		% within q86	71.2%	67.2%	56.0%	50.0%	66.7%	100.0%	62.0%
	Male	% within Sex	16.9%	22.5%	44.9%	14.6%	1.1%		100.0%
		% within q86	28.8%	32.8%	44.0%	50.0%	33.3%		38.0%
Total		% within Sex	22.2%	26.1%	38.9%	11.1%	1.3%	.4%	100.0%
		% within q86	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

10.4% females and 14.6% males did occasional health care to their family. 53.8% females and 39.4% males do give health care to family. It can observed that 15% males are still lagging behind in giving health care to family. 35.2% females and 44.9% males are occasionally dealt with the family health care. But there is no significant relationship found in gender and timely health care.

Table 4.87

Gender and Timely intake of food

			Timely intake of food					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	33.1%	26.9%	27.6%	8.3%	4.1%	100.0 %
		% within q87	80.0%	52.0%	55.6%	66.7%	66.7%	62.0%
	Male	% within Sex	13.5%	40.4%	36.0%	6.7%	3.4%	100.0 %
		% within q87	20.0%	48.0%	44.4%	33.3%	33.3%	38.0%
Total		% within Sex	25.6%	32.1%	30.8%	7.7%	3.8%	100.0 %
		% within q87	100.0%	100.0%	100.0%	100.0%	100.0%	100.0 %

Food on time is an important attribute in the health status of a person. 12.3% females and 10.1% males failed to take food on time, where as 27.3% and 36.0% of females and males are taking their food ‘sometimes’ on time. Where as 60.0% females and 53.9% males do take food on time. But in the chi-square analysis there is a significant relationship between gender and their food habits.

Table 4.88
Gender and Regular Medical check up

			Regular Medical check up					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	9.7%	9.0%	32.4%	31.7%	17.2%	100.0%
		% within q88	77.8%	65.0%	54.7%	62.2%	69.4%	62.0%
	Male	% within Sex	4.5%	7.9%	43.8%	31.5%	12.4%	100.0%
		% within q88	22.2%	35.0%	45.3%	37.8%	30.6%	38.0%
Total		% within Sex	7.7%	8.5%	36.8%	31.6%	15.4%	100.0%
		% within q88	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Regular medical check up is an attribute to of health index. 48.9% of females and 43.9% males hardly do medical check up, where as only 18.7% of females and 12.3% of males do regular medical check up. Where as 32.4% and 43.8% done the check up sometimes. But in the chi-square analysis there is no significant relationship between gender and regular check up.

Table 4.89

Gender and Unhealthy Mode

			Unhealthy Mode					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	5.5%	13.7%	41.1%	34.9%	4.8%	100.0 %
		% within q89	72.7%	66.7%	64.5%	58.0%	50.0%	61.9%
	Male	% within Sex	3.3%	11.1%	36.7%	41.1%	7.8%	100.0 %
		% within q89	27.3%	33.3%	35.5%	42.0%	50.0%	38.1%
Total		% within Sex	4.7%	12.7%	39.4%	37.3%	5.9%	100.0 %
		% within q89	100.0%	100.0%	100.0%	100.0%	100.0 %	100.0 %

19.2 of females and 14.4% of males found themselves in a regular unhealthy mode of course, unhealthy mode is a direct indication of absence of health. 39.7% of females and 48.9% of males found that they are in a good health condition always, where as 41.1% of females and 36.2% males responded that at times they found that they are in a quite unhealthy mode.

Table 4.90
Gender and taking medical help

			Taking medical help					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	4.4%	6.7%	37.8%	45.2%	5.9%	100.0%
		% within q90	75.0%	47.4%	65.4%	61.0%	47.1%	60.8%
	Male	% within Sex	2.3%	11.5%	31.0%	44.8%	10.3%	100.0%
		% within q90	25.0%	52.6%	34.6%	39.0%	52.9%	39.2%
Total		% within Sex	3.6%	8.6%	35.1%	45.0%	7.7%	100.0%
		% within q90	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

11.1% of females and 13.8% of males end up in taking medical help. Medical help is indicating a emergency health condition. 51.1% of females and 55.1% of males hardly took any medical care and thus healthy. 37.8% of females and 31.0% of males, do take medical care and respond that they are unhealthy sometimes. In th chi-square analysis there is no significant relationship between gender and emergency health condition.

Table 4.91

Gender and Hospitalisation

			Hospitalisation				
			0	1	2	4	Total
Sex	Female	% within Sex	30.3%	60.6%	6.1%	3.0%	100.0%
		% within q91a	66.7%	66.7%	66.7%	100.0%	67.3%
	Male	% within Sex	31.3%	62.5%	6.3%		100.0%
		% within q91a	33.3%	33.3%	33.3%		32.7%
Total		% within Sex	30.6%	61.2%	6.1%	2.0%	100.0%
		% within q91a	100.0%	100.0%	100.0%	100.0%	100.0%

3.0% of females got hospitalized 4 times in six months, 6.1% of females and 6.3% of males took the hospital facility 2 times in six months. Where 60.6% of females and 62.5% males are hospitalized once in six months. 30.3% of females and 31.3% males haven't hospitalized at all in the last six months. But there is no significant relationship between gender and hospitalization.

Table 4.92

Gender and Networking in the company

			Networking in the company					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	31.9%	28.5%	30.6%	6.9%	2.1%	100.0%
		% within Networkng	69.7%	54.7%	65.7%	62.5%	50.0%	62.6%
	Male	% within Sex	23.3%	39.5%	26.7%	7.0%	3.5%	100.0%
			30.3%	45.3%	34.3%	37.5%	50.0%	37.4%
Total		% within Sex	28.7%	32.6%	29.1%	7.0%	2.6%	100.0%
			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Networking with colleagues is very important attribute in socialisation. 60.4% females and 62.8% males do part of networking with their colleagues, where as 9.0% of females and 10.5% of males hardly do. 30.6% of females and 26.7% of males do networking with the colleagues sometimes. In the chi-square analysis there is no significant relationship between gender and socialisation with in the company.

Table 4.93

Gender and Networking with friends and relatives

			Networking with friends and relatives					
			Always	Very frequently	Sometimes	Occasionally	Never	Total
Sex	Female	% within Sex	21.7%	34.3%	30.8%	9.8%	3.5%	100.0%
		% Networking	58.5%	59.0%	65.7%	73.7%	55.6%	61.9%
	Male	% within Sex	25.0%	38.6%	26.1%	5.7%	4.5%	100.0%
			41.5%	41.0%	34.3%	26.3%	44.4%	38.1%
Total		% within Sex	22.9%	35.9%	29.0%	8.2%	3.9%	100.0%
			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

13.3% of females and 10.2% of males hardly visit their friends and relatives. 30.8% of females and 26.1% of males do network in their social circle sometimes. 56.0% of females and 63.6% of males do network with their real and dear ones. There is no significant relationship between gender and networking with friends and relatives in chi-square analysis.

Table 4.94

Gender and Membership in social organization

			Membership in social organization		
			Yes	No	Total
Sex	Female	% within Sex	20.8%	79.2%	100.0%
		% within member of Social Org	62.5%	62.3%	62.3%
	Male		20.7%	79.3%	100.0%
			37.5%	37.7%	37.7%
Total			20.8%	79.2%	100.0%
			100.0%	100.0%	100.0%

Membership in any social organization is a strong indication of socio-political involvement. 79.2% of females and 79.3% of males don't have any sort of connection in any social organization, Where as 20.8% of females and 20.7% of males do have membership in social organization. In chi-square analysis there is no significant relationship between gender and membership in any social organization.

Table 4.95

Gender and Social activities

			Social activities		
			Yes	No	Total
Sex	Female	% within Sex	40.0%	60.0%	100.0%
		% within Social activity	60.4%	64.0%	62.5%
	Male		43.7%	56.3%	100.0%
			39.6%	36.0%	37.5%
Total			41.4%	58.6%	100.0%
			100.0%	100.0%	100.0%

Involvement in social activity is a clear indication of socio-political involvement. 60.0% of females and 56.3% of males don't have any social activity. Where as 40.0% of females and 43.7% of males do have social activities in life. But in the chi-square analysis there is no significant relationship between gender and involvement in social activity.

Table 4.96

Gender and Reading Habits

			Reading Habits		
			Yes	No	Total
Sex	Female	% within Sex	69.7%	29.7%	100.0%
		% within reding habits	58.0%	74.1%	62.2%
	Male		83.0%	17.0%	100.0%
			42.0%	25.9%	37.8%
Total		% within Sex	74.7%	24.9%	100.0%
		% within q96	100.0%	100.0%	100.0%

29.7% of female and 17.0% of males don't read newspapers regularly which is a clear indication of disinterest in social and political issues, where as 69.7% of females and 83.0% of males do read. In the chi-square analysis there is significant relationship between gender and reading news paper.

Table 4.97
Gender and Vote in elections

			Vote in elections		
			Yes	No	Total
Sex	Female	% within Sex	80.1%	19.9%	100.0%
		% Do Vote	59.4%	74.4%	61.9%
	Male		88.9%	11.1%	100.0%
			40.6%	25.6%	38.1%
Total			83.5%	16.5%	100.0%
			100.0%	100.0%	100.0%

19.1% females and 11.1% males don't vote in election where as 80.1% females and 88.9% do vote. There is significant relationship in chi-square analysis.

Table 4.98

Gender and Hobbies

			Hobbies		
			Yes	No	Total
Sex	Female	% within Sex	88.7%	11.3%	100.0%
		% Hobbies	61.0%	66.7%	61.6%
	Male		90.9%	9.1%	100.0%
			39.0%	33.3%	38.4%
Total			89.5%	10.5%	100.0%
			100.0%	100.0%	100.0%

In case of hobbies there is no hobbies for 11.3% of females and 9.1% of males don't have any hobby, where as 88.7% of females and 90.9% males do have. But in chi-square analysis there is no significant relationship between gender and hobby.

Table 4.98

Gender and work life conflict

			Work Life Conflict		
			Yes	No	Total
Sex	Female	% within Sex	29.9%	69.4%	100.0%
		Work life Conbflict %	76.8%	56.5%	61.5%
	Male		14.4%	85.6%	100.0%
			23.2%	43.5%	38.5%
Total			23.9%	75.6%	100.0%
			100.0%	100.0%	100.0%

Work-Life conflict is again an indication of high stress in life. 29.9% of females and 14.4% of males do have work life conflict where as 69.4% and 85.6% don't have work-life conflict. In chi-square analysis there is significant relationship between gender and work-life conflict.

Table 4.99
Gender and Disagreement with spouse

			Disagreement with spouse		
			Yes	No	Total
Sex	Female	% within Sex	17.5%	82.5%	100.0%
		Disareement wt spouse	64.7%	64.2%	64.3%
	Male	% within Sex	17.1%	82.9%	100.0%
			35.3%	35.8%	35.7%
Total		% within Sex	17.3%	82.7%	100.0%
			100.0%	100.0%	100.0%

Table 4.100
Gender and Satisfaction in family life

			Satisfaction in family life		
			Yes	No	Total
Sex	Female	% within Sex	97.0%	3.0%	100.0%
		%Satisfied family life	64.2%	50.0%	63.6%
	Male		94.7%	5.3%	100.0%
			35.8%	50.0%	36.4%
Total			96.2%	3.8%	100.0%
			100.0%	100.0%	100.0%

Satisfaction in family life is a clear indication of peace in mind. 3.0% of females and 5.3% males don't have family life satisfaction where as 97.0% of females and 94.7% of males do have. In chi-square analysis there is no significant relationship between gender and family life satisfaction.

Table 4.101

Gender and Security in Society

			Security in Society		
			Increased	Not increased	Total
Sex	Female	% within Sex	31.0%	69.0%	100.0%
		Security in Society	51.1%	69.4%	62.2%
	Male		48.9%	50.0%	100.0%
			48.9%	30.6%	37.8%
Total			37.8%	61.8%	100.0%
			100.0%	100.0%	100.0%

Security in society is a strong attribute of social attrocity. 31.0% of females and 48.9% males responded that social attrocity haven't increased heavily where as 69.0% females and 50.0% males found that social insecurity have increased. In chi-square analysis it is found that there is significant relationship between gender and security in society.

Table 4.102

Gender and Critical life situations

			Critical life situations			
			Worried	Not worried	3	Total
Sex	Female	% within Sex	69.4%	29.9%	.7%	100.0%
		Worried of life Situations	67.1%	53.1%	100.0%	62.3%
	Male		56.3%	43.7%		100.0%
			32.9%	46.9%		37.7%
Total			64.5%	35.1%	.4%	100.0%
			100.0%	100.0%	100.0%	100.0%

69.4% of females and 56. Males responded that they are worried and 29.9% of females and 43.7% of males aren't worried and in chi-square analysis there is significant relationship between gender and worried natures.

Table 4.103

Gender and preventing physical attacks

			preventing physical attacks		
			Can prevent	Cannot prevent	Total
Sex	Female	% within Sex	62.7%	36.6%	100.0%
		Prevent Physical attack	56.3%	74.3%	62.0%
	Male		79.3%	20.7%	100.0%
			43.7%	25.7%	38.0%
Total			69.0%	30.6%	100.0%

36.6% of females and 20.7% of males respond that they can't prevent any attacks and so in secured, where as 62.7% of female and 79.3% of males respond that they are in a better situation. In chi-square analysis there is significant relationship between gender and prevention of social attack.

Table 4.104

Gender and travelling during night

			q108		
			Scared	Not scared	Total
Sex	Female	% within Sex	66.4%	33.6%	100.0%
		Travel at night	89.4%	37.6%	61.1%
	Male		12.4%	87.6%	100.0%
			10.6%	62.4%	38.9%
Total			45.4%	54.6%	100.0%
			100.0%	100.0%	100.0%

Scared to travel during night, 66.4% of females and 12.4% of males scared to travel at night. Where as 33.6% of female and 87.6% of male not scared and ready to travel during night. In chi-square analysis there is significant relationship between gender and scared nature to travel at night.

Table 4.105

Gender and atrocities during journey

			atrocities during journey		
			Yes	No	Total
Sex	Female	% within Sex	45.4%	54.6%	100.0%
		% within q109	75.0%	49.6%	58.6%
	Male	% within Sex	21.4%	78.6%	100.0%
		% within q109	25.0%	50.4%	41.4%
Total		% within Sex	35.5%	64.5%	100.0%
		% within q109	100.0%	100.0%	100.0%

Attrocities during journey,45.4% of females and 21.4% of males responded there is attrocities during journey. Where as 54.6% of females and 78.6% of males found no attrocity during journey. The relationship is highly significant between gender and attrocity during journey.

Table 4.106

Gender and existing legal system

			existing legal system		
			Sufficient	Not sufficient	Total
Sex	Female	% within Sex	15.6%	84.4%	100.0%
		Legal system	39.3%	70.0%	62.4%
	Male		40.0%	60.0%	100.0%
			60.7%	30.0%	37.6%
Total			24.8%	75.2%	100.0%
			100.0%	100.0%	100.0%

84.4% of females are responding that the existing legal system is not sufficient, where as 60.0% of men support the view. 15% of female and 40 % of male are happy with the existing legal system. Out of the total responded that the system is sufficient 39.3% are females and 60.7% are males. In the other way round who mentioned the system is not sufficient 70.0% are females and 30.0% are males

Table 4.107

Abortions

		Frequency	Percent	Valid Percent	Cumulative Percent
	Spontaneous	7	2.9	53.8	53.8
	Induced	4	1.7	30.8	84.6
	Still birth	2	.8	15.4	100.0
	Total	13	5.5	100.0	
Missing	System	225	94.5		
Total		238	100.0		

The status of the health condition is also showing poor indicators. The response on abortions from the female respondents showing that there is a quite good number of Spontaneous and Induced abortions are taking place with the percentages 53.8% and 30.8%. In the case of still birth 15.4% are part of this section.

Empirical Results of Regression Analysis.

$\hat{Y}i$ = -23.979 + 2.8694D_1 + 2.32825 D_2 + 0.231475P_E + 2.69834E_R - 0.0000026(I)

Std. Error (28.9.99) (4.07854) (4.02883) (0.173055) (1.83565) 0.0000026

t-ratio (-0.8294) (0.7036) (0.5779) (1.3376) (1.4700) (-0.9850)

p-value (0.40771) (0.48241 (0.56389) (0.18234) (0.14293) (0.32563)

$\hat{Y}_i$ = -23.979 + 2.8694 + 2.32825 + 0.231475P_E + 2.69834E_R -0.0000026(I)

$\hat{Y}_i$ = -23.979 + 2.8694 + 0.231475P_E + 2.69834E_R -0.0000026(I)

$\hat{Y}_i$ = -23.979 + 0.231475P_E + 2.69834E_R -0.0000026(I)

$\hat{Y}_i$ = -23.979 + 2.32825 + 0.231475P_E + 2.69834E_R -0.0000026(I)

Co-efficient in the regression analysis, in the case of Single Male the empowerment Index is more , where as the female married is showing poor index value, the male married and the female married are showing the index value next to the Married Female

R-squared	0.029334
F(5, 232)	1.402241

Adjusted R-squared	0.008415
P-value(F)	0.224251

The R- Squared value is low and thus the adjusted R Square and F Value , So the overall significance the model is strongly questioned. The P value is also not valid.

Regression Analysis with Decision Making Index

$Y_i = 30.4052 + 16.3177D_1 - 22.4176\ D_2 + 0.0107004\ P_E + 3.13172E_R - 0.0000022(I)$

Dependent variable: Decision_Making_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	30.4052	27.3105	1.1133	0.26673	
Dummy One	16.3177	3.85291	4.2352	0.00003	***
Dummy Two	-22.4176	3.80594	-5.8902	<0.00001	***
Father_Mother_s_Edun	0.0107004	0.163481	0.0655	0.94787	
Yrs_f_Edn_f_Respondent	3.13172	1.7341	1.8060	0.07222	*
Generated_Income	2.17944e-05	2.49551e-05	0.8733	0.38338	

$\hat{Y}_i = 30.4052 + 16.3177 - 22.4176 + 0.0107004\ P_E + 3.13172E_R - 0.0000022(I)$

$\hat{Y}_i = 30.4052 + 16.3177 + 0.0107004\ P_E + 3.13172E_R - 0.0000022(I)$

$\hat{Y}_i = 30.4052 + 0.0107004\ P_E + 3.13172E_R - 0.0000022(I)$

$\hat{Y}_i = 30.4052 + -22.4176 + 0.0107004\ P_E + 3.13172E_R - 0.0000022(I)$

Co-efficient in the regression analysis, in the case of Single Male the Decision Index is less than the case of a Married Male the category which have high decision making index , where as the female married is showing a better index value, than the single female. In short the regression coefficient is high for married male then to married females, where as single males followed the index value position.

The dummy variables gender and marital status are highly significant in the model with 1% level of significant. Where as years of education of the respondent is also valid position in the regression model of decision making index with 10% level of significance.

R-squared	0.200317	Adjusted R-squared	0.183083
F(5, 232)	11.62300	P-value(F)	0.000000

The R- R-squared value shows that , dependent variable is 20% explained by the

Independent variables in the model. The P Value is also highly significant, which shows the overall significance of the model.

Regression Analysis with Decision Health Index

Health Index

$\hat{Y}_i$ = -34.5411-8.55976D_1 -7.09195D_2 + 0.039803P_E + 1.96644E_R -0.0000081(I)

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-34.5411	49.6372	-0.6959	0.48721	
Dummy_One	-8.55976	7.0027	-1.2223	0.22282	
Dummy_Two	-7.09195	6.91735	-1.0252	0.30632	
Father_Mother_s_Edun	0.039803	0.297129	0.1340	0.89355	
Yrs_f_Edn_f_Respondent	1.96644	3.15175	0.6239	0.53329	
Generated_Income	-0.0000081	0.0000045	-1.7901	0.07474	*

$\hat{Y}_i$ = -34.5411-8.55976 -7.09195 + 0.039803P_E + 1.96644E_R -0.0000081(I)

$\hat{Y}_i$ = -34.5411-8.55976+ 0.039803P_E + 1.96644E_R -0.0000081(I)

$\hat{Y}_i$ = -34.5411+ 0.039803P_E + 1.96644E_R -0.0000081(I)

$\hat{Y}_i$ = -34.5411-7.09195+ 0.039803P_E + 1.96644E_R -0.0000081(I)

The regression results shows that very poor health index is for single male and then married male. A better index is for married female. The variable Income is highly significant in this model of the regression of health index.

R-squared	0.023902
F(5, 232)	1.136206

Adjusted R-squared	0.002865
P-value(F)	0.341914

The R-squared value is very low , thus the F value and P value which shows that the overall significance of the model is too low.

Regression Analysis with Attrocity Index

$\hat{Y}_i$ = -146.878+46.9461 D_1+ 11.786 D_2 -0.205482 P_R + 7.73217E_R -0.0000017(I)

Dependent variable: Atrocity_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-146.878	45.2017	-3.2494	0.00133	***
Dummy_One	46.9461	6.37696	7.3618	<0.00001	***
Dummy_Two	11.786	6.29923	1.8710	0.06260	*
Father_Mother_s_Edun	-0.205482	0.270578	-0.7594	0.44837	
Yrs_f_Edn_f_Respondent	7.73217	2.87011	2.6940	0.00758	***
Generated_Income	-1.79588e-05	4.13032e-05	-0.4348	0.66411	

$\hat{Y}_i$ = -146.878+46.9461 + 11.786 -0.205482 P_R + 7.73217E_R -0.0000017(I)

$\hat{Y}_i$ = -146.878+46.9461 -0.205482 P_R + 7.73217E_R -0.0000017(I)

$\hat{Y}_i$ = -146.878 -0.205482 P_R + 7.73217E_R -0.0000017(I)

$\hat{Y}_i$ = -146.878+ + 11.786 -0.205482 P_R + 7.73217E_R -0.0000017(I)

The regression results are showing better coefficients for male single then to male married, atrocity is high for married female than of the single female. The dummy variable gender is showing a significant variable in this case of atrocity , for 1% level of siginificance. The dummy two marital status is also well explained in the model with 10 % significance level.

Years of education of the respondent is another variable which is showing good explanation in the model, the p value is significant at 10% level

R-squared	0.229030
F(5, 232)	13.78392

Adjusted R-squared	0.212414
P-value(F)	0.000000

The R-squared value is 22% and the P value is highly significant , which is showing the overall significance of the model.

Regression Analysis with Socio-Political Index

$\hat{Y}_i = 7.46832+5.20007\,D_1+15.3821D_2+0.401774P_R+0.406442E_R-0.0000046(I)$

Model 1: OLS, using observations 1-238
Dependent variable: Socio_Politi_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	7.46832	36.6037	0.2040	0.83851	
Dummy_One	5.20007	5.16397	1.0070	0.31499	
Dummy_Two	15.3821	5.10102	3.0155	0.00285	***
Father_Mother_s_Edun	0.401774	0.21911	1.8337	0.06799	*
Yrs_f_Edn_f_Respondent	0.406442	2.32418	0.1749	0.86133	
Generated_Income	-4.68293e-05	3.34467e-05	-1.4001	0.16281	

$Y_i = 7.46832+5.20007+15.3821+0.401774P_R+0.406442E_R-0.0000046(I)$

$Y_i = 7.46832+5.20007+0.401774P_R+0.406442E_R-0.0000046(I)$

$Y_i = 7.46832+0.401774P_R+0.406442E_R-0.0000046(I)$

$Y_i = 7.46832+15.3821+0.401774P_R+0.406442E_R-0.0000046(I)$

The Socio Political Index is high for single male and then comes single female , then the regression coefficients are high for married male and last comes married female.

The dummy two marital status, variable is significant for 1% level of significance. years of education of the parents is another variable which is highly significant for 10% level of significance level.

R-squared	0.071110	Adjusted R-squared	0.051091
F(5, 232)	3.552102	P-value(F)	0.004095

Regression Analysis with Stress Index

$Y_i = -53.2036+9.42761D_1+16.296D_2+0.426305P_R+2.56162E_R-0.0000033(I)$

Model 1: OLS, using observations 1-238

Dependent variable: Stress_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
Const	-53.2036	40.0718	-1.3277	0.18558	
Dummy_One	9.42761	5.65324	1.6676	0.09674	*
Dummy_Two	16.296	5.58433	2.9182	0.00387	***
Father_Mother_s_Edun	0.426305	0.23987	1.7772	0.07684	*
Yrs_f_Edn_f_Respondent	2.56162	2.54439	1.0068	0.31509	
Generated_Income	-3.31913e-05	3.66157e-05	-0.9065	0.36562	

$\hat{Y}_i$ = -53.2036+9.42761+ 16.296+0.426305 P_R + 2.56162E_R -0.0000033(I)

$\hat{Y}_i$ = -53.2036+9.42761+0.426305 P_R + 2.56162E_R -0.0000033(I)

$\hat{Y}_i$ = -53.2036+0.426305 P_R + 2.56162E_R -0.0000033(I)

$\hat{Y}_i$ = -53.2036+ 16.296+0.426305 P_R + 2.56162E_R -0.0000033(I)

The regression coefficients are showing that the single male and single female are showing better results for stress index, where as the highly stressed category are married female and then married male.

The dummy variable two , marital status is significant at 1% level , where as gender and parental education are significant at 10% significance level.

R-squared	0.076947
F(5, 232)	3.867995
Adjusted R-squared	0.057054
P-value(F)	0.002190

Regression Analysis with Job Satisfaction Index

$\hat{Y}_i$ = -15.5064-0.809624D_1+ 0.0565115D_2+0.195552P_R + 1.63264E_R -0.0000021(I)

Model 1: OLS, using observations 1-238

Dependent variable: Job_Satisfaction_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*
const	-15.5064	27.0409	-0.5734	0.56690
Dummy One	-0.809624	3.81487	-0.2122	0.83212
Dummy Two	0.0565115	3.76837	0.0150	0.98805
Father_Mother_s_ Edun	0.195552	0.161867	1.2081	0.22824
Yrs_f_Edn_f_Respondent	1.63264	1.71698	0.9509	0.34266
Generated_Income	2.14809e-06	2.47087e-05	0.0869	0.93080

R-squared	0.012928
F(5, 232)	0.607738

Adjusted R-squared	-0.008345
P-value(F)	0.694064

Regression Analysis with Work Status Index

$$\hat{Y}_i = -52.5855+9.83121D_1+0.695D_2+0.254528P_R + 5.40027E_R - 0.0000032(I)$$

Model 1: OLS, using observations 1-238
Dependent variable: Work_Status_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-52.5855	48.7836	-1.0779	0.28218	
Dummy_One	9.83121	6.88229	1.4285	0.15450	
Dummy_Two	0.695	6.7984	0.1022	0.91866	
Father_Mother_s_ Edun	0.254528	0.292019	0.8716	0.38432	
Yrs_f_Edn_f_Respondent	5.40027	3.09755	1.7434	0.08259	*
Generated_Income	3.29452e-05	4.45762e-05	0.7391	0.46061	

Adjusted R-squared	0.012880
P-value(F)	0.155922

$$Y_i = -37.8344+11.1933D_1+2.10088D_2+0.160454P_R + 3.26161E_R - 0.0000017(I)$$

Model 1: OLS, using observations 1-238
Dependent variable: PQLI

	Coefficient	*Std. Error*	*t-ratio*	*p-value*

const	-37.8344	21.3404	-1.7729	0.07756	*
Dummy_One	11.1933	3.01066	3.7179	0.00025	***
Dummy_Two	2.10088	2.97396	0.7064	0.48063	
Father_Mother_s_Edun	0.160454	0.127744	1.2561	0.21036	
Yrs_f_Edn_f_Respondent	3.26161	1.35502	2.4071	0.01686	**
Generated_Income	-1.74693e-05	1.94998e-05	-0.8959	0.37125	

R-squared	0.101688
F(5, 232)	5.252405

Adjusted R-squared	0.082327
P-value(F)	0.000137

The quality of life index is highly significant with P value and the overall significance model is good. The variables years of education of respondents is significant at 5% level and dummy one gender is also significant at 1% significance

Trend analysis of growth models

Regression Analysis Of Domestic Software Data

ANOVA table

Source	*SS*	*df*	*MS*	*F*	*p-value*
Regression	4.2503	1	4.2503	674.08	6.99E-14
Residual	0.0946	15	0.0063		
Total	4.3449	16			

Regression output					*confidence interval*	
variables	*coefficients*	*std. error*	*t (df=15)*	*p-value*	*95% lower*	*95% upper*
Intercept	2.6554					
t	0.1021	0.0039	25.963	6.99E-14	0.0937	0.1104

coefficients in terms of the model: ab^x

452.303	= a, beginning value
1.265	= b, growth factor
26.49%	average rate of change

Export

ANOVA table

Source	*SS*	*df*	*MS*	*F*	*p-value*
Regression	8.9027	1	8.9027	113.22	2.19E-08
Residual	1.1794	15	0.0786		
Total	10.0822	16			

Regression output					*confidence interval*	
variables	*coefficients*	*std. error*	*t (df=15)*	*p-value*	*95% lower*	*95% upper*
Intercept	2.6738					
t	0.1477	0.0139	10.641	2.19E-08	0.1181	0.1773

coefficients in terms of the model: ab^x

471.843	= a, beginning value

1.405	= b, growth factor
40.51%	average rate of change

Regression Analysis of Total

ANOVA table					
Source	*SS*	*df*	*MS*	*F*	*p-value*
Regression	6.2689	1	6.2689	822.92	1.61E-14
Residual	0.1143	15	0.0076		
Total	6.3832	16			

Regression output					*confidence interval*	
variables	*coefficients*	*std. error*	*t (df=15)*	*p-value*	*95% lower*	*95% upper*
Intercept	3.0657					
t	0.1240	0.0043	28.687	1.61E-14	0.1147	0.1332

coefficients in terms of the model: ab^x	
1163.380	= a, beginning value
1.330	= b, growth factor
33.03%	average rate of change

The growth models is showing that export of software industry is growing at 40.51% and domestic sector of the industry is growing at 26.49% where as the total is growing by 30.4%

Wilcoxon - Mann/Whitney Test for the Stress Index

n	sum of ranks	
147	16630.5	Females
90	11572.5	Males
237	28203	total

17493.00	expected value
505.35	standard deviation
-1.71	z, corrected for ties

.0881	p-value (two-tailed)

The Wilcoxon - Mann/Whitney Test for the Stress Index is showing that there is no significant different among the gender

Wilcoxon - Mann/Whitney Test for Work Status Index

n	sum of ranks	
147	21468	Female
91	6973	Male
238	28441	total

17566.50	expected value
512.31	standard deviation
7.61	z, corrected for ties
2.64E-14	p-value (two-tailed)

Wilcoxon - Mann/Whitney Test calculated for Attrocity Index

n	sum of ranks	
147	14032.5	Atrocity Index Group
91	14408.5	2
238	28441	total

17566.50	expected value
511.62	standard deviation
-6.91	z, corrected for ties
4.97E-12	p-value (two-tailed)

Wilcoxon - Mann/Whitney Test for Job Satisfaction

n	sum of ranks	
147	17564.5	Average Group
91	10876.5	2
238	28441	total

17566.50	expected value
513.38	standard deviation
0.00	z, corrected for ties
.9977	p-value (two-tailed)

Wilcoxon - Mann/Whitney Test for Socio Political Index

n	sum of ranks	
147	16893	Socio-Politi-Index Group
91	11548	2
238	28441	total

17566.50	expected value
496.88	standard deviation
-1.35	z, corrected for ties
.1756	p-value (two-tailed)

Wilcoxon - Mann/Whitney Test for quality of life Index

n	sum of ranks	
147	15599.5	PQLI Group
92	13080.5	2
239	28680	total

17640.00	expected value
520.08	standard deviation
-3.92	z, corrected for ties
.0001	p-value (two-tailed)

Wilcoxon - Mann/Whitney Test for Decision making Index

n	sum of ranks	
147	15850	Decision Making Index Group
91	12591	2
238	28441	total

17566.50	expected value
491.88	standard deviation
-3.49	z, corrected for ties
.0005	p-value (two-tailed)

Chapter 5

Indian ITES Industry – An Overview

Outsourcing is term used when organizations contract manufacturing or services to third-party vendors, either domestically or offshore. Outsourcing has existed for many decades in the manufacturing sector. Services outsourcing occurs when organizations contract services to third-party vendors, either domestically or Offshore. This is also generally known as BPO, which is the delegation of ownership, administration and operation of a business process or processes to a third party, or external service provider. The external service provider, in turn, administers and manages the process or processes in compliance with some measurable performance metrics. BPO services can be either delivered domestically or from abroad)

Although Organizations have usually outsourced many services functions domestically (delivered through IT or non-IT) for many decades, the international sourcing of business support services or offshore BPO is a relatively recent phenomenon. It has been enabled by rapid developments in Information technology (IT) systems and broadband communications and by the liberalization of trade in services, which are making services more easily tradable. As a result, the production of many services has become increasingly location independent. Examples of such IT/ICT-enabled BPO services include software programming and design, call centre operations, accounting and payroll operations, medical records transcription, paralegal services, and software research and testing.

ITES has emerged as a popular competitive strategy for global corporations that believe they must perform their business processes offshore in order to cut costs and survive in the domestic and international marketplace. Cost savings may vary from industry to industry and country to country, but most Industry expert estimates range between 30-60%.

Origin and Evolution of the ITES Industry

The trend of outsourcing services began in the US during the 1990's when the industry there had to outsource service functions to meet the domestic IT labour shortage caused by the year 2000(Y2K) bug work load and the boom of the dot-com economy.

Outsourcing of services has been encouraged by information and communication technology (ICT) improvements and expected business benefits. Recent developments in the telecommunications industry, such as technology improvements, infrastructure growth in developing countries, and decreasing data transmission costs, have facilitated the use of outsourcing. Other IT advances, such as standardization of business applications and network protocols, have increased system interoperability and thus further facilitated offshore sourcing. Additionally , the world wide use of the personal computer in conjunction with the global availability of the internet has enabled organizations to digitally share and transmit documents over private networks .

Phases of Evolution

First Phase of Evolution

In the first phase of evolution of the ITes industry in India, many MNCs established captive units in India for customer support and transaction processing. General Electric Capital Services (now Genpact) was the first MNC to pioneer ITES in India when it opened an India-based international call centre in 1997 to perform tasks such as money collection, credit-card servicing and data management. Other multinationals followed, establishing their own captive wholly-owned offshore facilities. These included British Airways (World Network Services), HSBC and Swiss air.

Second Phase of Evolution:

In the second phase, third-party units were set up in India by, MNCs (for outsourcing activities), non-resident Indians (NRls), Indian independents, and Indian) IT companies established software services such as Infosys, Wipro and Satyam ventured in to the ITES business in 2002 by establishing subsidiaries.
Developed IT outsourcing firms tend to move towards higher value add products competing to a greater extent on specialized talent.

Third Phase of Evolution:

The third phase of evolution of the ITes industry in India has been characterized by the increasing trend towards geographical dispersion of activities mergers & acquisitions (M&As) have also taken place within the industry in this phase.
Going forward competing small and medium -sized firms with complementary skills are likely to merge their operations to compete with larger global firms.

Fourth Phase of Evolution:

In the current and fourth phase of evolution of the ITES industry in India there is an increasing trend towards Indian companies acquiring small- to medium-size businesses in overseas locations. These foreign acquisitions mark a contrast to the practice of foreign MNCs setting up BPO units in India to take advantage of the lower costs here. Many of these players have had long in the domestic market and are now offering offshore BPO services.

Prospects of India in the Industry

India is expected to be the preferred destination foe ITES services. India's competitiveness on key parameters is expected to be maintained. However, India's current share of 46% of the global ITES market may be challenged by many other countries, most notably by china, the Philippines, and Malaysia. These countries they compete in certain specific areas, such as Philippines in call centres. Eastern European and Asian countries remain the leading outsourcing destinations for western European countries. National Association of

Software and Services Companies (NASSCOM) has signed an agreement that could encourage and allow European small and medium enterprises (SMEs) to use outsourcing opportunities in India.

As compared with China India's supply of qualified labour also seems set to increase over the next decades. By 2020, the supply of qualified labour in India in the age group 20-34 years should increase by around 66 million people, or some 4.4 million people per year.

Table: 5.1 Population Aged 15-34 Years in Select countries

In million

	2005		2010		2020	
	20-24	**25-34**	**20-24**	**25-34**	**20-24**	**25-34**
China	100	217	117	196	94	215
India	101	171	109	186	116	222
Philippines	8	13	9	16	9	17
US	21	40	22	42	22	48
Europe	51	104	50	102	38	93
World	**555**	**996**	**599**	**1042**	**590**	**172**

Market Size of IT-ITes Industry

Overview

The Indian Software & services industry has grown at a remarkable pace since 2001-02. The overall Indian Software & Services industry revenue have grown from US$ 10.2 billion in 2001-02 to reach US $ 58.7 billion in 2008-09- translating to a CAGR of about 26.9 per cent. Despite the severe global recession, the industry grew at modest rate of 12.9 % in 2008-09.IT-ITES industry's growth trends are given in the table below.

The size of the Indian ITES market is US$7.2 billion (Rs. 318 billion) as of 2005-06, as compared with US$5.2biilion (Rs. 236 billion) in 2004-05. Between 2004-06, industry revenues are estimated to have increased at a three-year compounded annual growth rate (CAGR) of 35% in rupee terms, and 39% in US dollar terms. Growth in rupee terms has been 35% during 2005-06, as compared with 52% in 2004-05, and 19% during 2003-04. Since the beginning of the outsourcing

trend in the late-1990s, revenues from exports have driven the growth of the Indian ITES industry. Export revenues have increased at a three-year CAGR of 32% to around Rs. 278 billion in 2005-06.

Table: 5.2 Revenue Trends in the Indian ITES Industry

Year/ Item	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	CAGR
IT-ITeS Exports	7.6	9.5	12.9	17.7	23.6	31.1	40.4	46.3	28.6
IT-ITeS Domestic	2.6	3.0	3.8	4.8	6.7	8.2	11.7	12.4	22.2
Total	10.2	12.5	16.7	22.5	30.3	39.3	52.0	58.7	26.9

Source: NASSCOM, Strategic Review, 2010

As per NASSCOM, the industry is diversified across three major focus segments – IT Services, BPO and software products & Engineering services. While IT Services have been the mainstay of the industry, BPO and Engineering services sector has built upon the India value proposition and today there exist integrated service providers across the three focus areas as well as niche providers. The major three components of IT Services sector are custom application development, application management and support and training. Other significant components are IT consulting, systems integration, Infrastructure Services (IS) outsourcing, network consulting & integration and software testing.

Among the verticals serviced by India's IT-ITES-BPO industry those that account for the largest share of revenue are banking, financial services and insurance(BFSI-41%), Hi-Tech/Telecom(20%), manufacturing(17%), retail(8%), with smaller contributions coming from media, publishing

and entertainment, construction and utilities, healthcare and airlines and transportation. Important industry verticals being serviced by the BPO segment are insurance, retail banking, travel and hospitality, auto manufacturing, telecom and pharmaceuticals. Horizontals such as Customer Interaction and Support (CIS), Finance and Accounting (F&A) and Human Resource Management (HRM) are important areas in the BPO segment.

Although export revenues still predominate, revenues in the domestic ITES industry have also exhibited strong growth in recent years. Domestic ITES revenues have increased at a three-year CAGR of 60% to an estimated
Rs. 40 billion in 200506. The share of domestic industry in total ITES revenues is estimated to have increased from 9% in 2003-04 to around 13% in 2005-06. Although initially, it is the small base that partly accounts for the high growth exhibited, the increased adoption of ITES services in the domestic industry does present an attractive growth opportunity, and has the potential to dilute the effect of any possible downturn in the overseas markets

Exports of IT-ITes Industry

Exports continue to dominate the revenues earned by the Indian Software & Services Industry. The export intensity (the share of IT-ITeS Exports to total IT-ITeS Revenue) of Indian Software & Services Industry has grown from 74.5% in 2001-02 to 78.9% in 2008-09. Total Software & Services Exports are estimated to have grown from US $ 7.6 billion to US $ 46.3 billion in 2008-09, a CAGR of 28.6%.
The share of ITES-BPO exports has nearly doubled during this period. The total ITeS -BPO exports is estimated to have increased from US $ 1.5 billion in 2001-02 to US $ 12.7 billion in 2008-09, a CAGR of about 39.2 per cent. BPO now accounts for about 27 per cent of total exports. The Indian BPO sector has not only added scale in the last nine years, but has also matured significantly in terms of scope of service offerings, buyer segments served and service delivery models. Apart from achieving maturity in the horizontal segment, providers are increasingly developing vertical/domain specialization to capture greater value.

The fastest growing segment however is software products. It is growing at a CAGR of 48.5 per cent. Segment wise export revenue trends are given in the table below.

Table 5.3 Segment wise export Revenue Trends in IT-ITES Industry

Year/ Item	2001 - 02	2002 - 03	2003 - 04	2004- 05	2005- 06	2006- 07	2007- 08	2008- 09	CAGR
IT Service	5.8	5.5	7.3	10.0	13.3	17.8	23.1	26.5	23.2
ITeS-BPO	1.5	2.5	3.1	4.6	6.3	8.4	10.9	12.7	39.2
Software Products, Engineering Services	0.3	1.5	2.5	3.1	4.0	4.9	6.4	7.1	48.5
Total IT-ITeS	7.6	9.5	12.9	17.7	23.6	31.1	40.4	46.3	28.6

Source: NASSCOM, Strategic Review, 2010

Domestic Market

Though the IT-BPO sector is export driven, the domestic market is also significant. The revenue from the domestic Software & Services market is estimated to have grown from US $ 2.6 billion in 2001-02 to US $ 12.4 billion in 2008-09 a CAGR of about 22.2 per cent.
In the Domestic verticals of the Indian IT-ITeS Industry the IT Services segments continue to dominate domestic portfolio of the industry. Its share however has declined from 80.8% in 2001-02 to 66.9% in 2008-09.

ITeS-BPO segment in the domestic market has witnessed noticeable growth over the past few years. The share of ITeS-BPO industry in domestic market is estimated to have increased from 3.8% in 2001-02 to 15.3% in 2008-09.

Table 5.4 Segment wise domestic Revenue Trends in IT-ITES Industry

Year/ Item	2001- 02	2002- 03	2003- 04	2004- 05	2005- 06	2006- 07	2007- 08	2008- 09	CAGR
IT Service	2.1	2.4	3.1	3.5	4.5	5.5	7.9	8.3	19.5

ITeS-BPO	0.1	0.2	0.3	0.6	0.9	1.1	1.6	1.9	44.5
Software Products, Engineering Services	0.4	0.4	0.4	0.7	1.3	1.6	2.2	2.2	23.7
Total IT-ITeS	2.6	3.0	3.8	4.8	6.7	8.2	11.7	12.4	22.2

Source: NASSCOM, Strategic Review, 2010

Employment Opportunities in IT-ITES Industry

The total IT Software and Services employment is estimated to touch 2.20 million in 2008-09, as compared to 0.52 million in 2001-02. This represents a net addition of 1.68 million to the industry employee base since 2001-02. The indirect employment attributed by the sector is estimated to about 8.0 million in 2008-09. This translates to the creation of about 10.20 million job opportunities attributed to the growth of this sector.

IT-ITeS Exports constitute the major source of employment for employment in this industry and its share has increased over the years. The share of IT-ITeS Exports segment in total employment of the IT Software & Services Industry has grown from 52.9% in 2001-02 to 77.6% in 2008-09 whereas, the share of domestic market in total employment of the IT Software & Services Industry has declined from 47.1% in 2001-02 to 22.6% in 2008-09.

Table: 5.5 Employment in IT- ITes Industry

Year/ Item	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
IT Services & Exports	0.17	0.21	0.30	0.39	0.51	0.69	0.86	0.92
BPO Exports	0.11	0.18	0.22	0.32	0.42	0.55	0.70	0.79
Domestic Market	0.25	0.29	0.32	0.35	0.38	0.38	0.45	0.50
Total Employment	0.52	0.67	0.83	1.06	1.29	1.62	2.01	2.21

Source: NASSCOM, Strategic Review, 2010

Segment-wise Revenues of the Industry

Of the total Indian ITES revenues during 2005-06, while customer interaction services accounted for 46%, finance & accounting (FA) contributed *40*%. The structure of the Indian ITES industry is undergoing a steady change, following the migration to higher-wide products in FA and HR, and the emergence of domain industry specialized service providers: For instance, the share of FA in total revenues has increased from 23% in 2003-04 to 40% in 2005-06. Correspondingly, although customer interaction services still constitute the largest segment in terms of revenues and manpower, they are expected to gradually lose their traditional importance, because of the emergence of lower-cost locations, and a shift towards higher value-added services.

Revenue Growth of Indian ITES Industry

Although customer interaction services account for around 49% of industry revenues, their share in the export markets is 46%. By comparison, their share in the domestic market is around 70%, reflecting the nascent stage of the domestic market. Of the domestic market for customer interaction services, the banking, financial services, insurance (BFSI), telecommunication; and consumer durables sectors account for 75·80% of the domestic business of the ITESindustry.

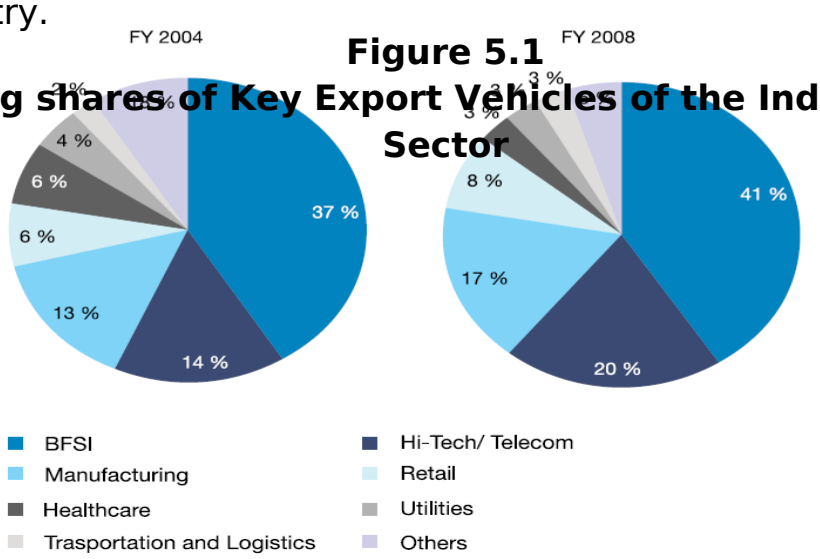

Figure 5.1

Changing shares of Key Export Vehicles of the Indian IT / ITeS Sector

Table 5.6
Global BPO Service Spending by Business Functions

Worldwide BPO Services Spending by Business Functions, 2008-2013 ($M)							
	2008	2009	2010	2011	2012	2013	2008-13 CAGR (%)
Key Horizontal Services							
Customer Care	58,983.6	62,766.8	68,635.3	75,379.4	83,650.6	92,051.4	9.3
Finance and Accounting	25,208.3	27,369.0	29,863.4	32,720.8	35,894.9	39,442.6	9.4
Human Resources	17,696.6	18,896.1	20,388.8	22,303.4	24,423.9	26,571.4	8.5
Procurement	2,112.3	2,471.8	2,891.0	3,349.1	3,852.4	4,429.9	16.0
Sub-Total	104,000.8	111,503.7	121,778.4	133,752.8	147,821.88	162,495.3	9.3
Other							
Training	7,381.9	7,443.9	7,893.6	8,430.2	8,872.5	9,283.7	4.7
Total	111,382.7	118,947.6	129,672.0	142,182.9	156,694.4	171,779.0	9.1

Source: IDC Worldwide and U.S. Business Process Outsourcing Services 2009-2013 Forecast

Table 5.7
Global BPO Service Spending by Region

Worldwide BPO Services Spending by Region, 2008-2013 ($M)							
	2008	2009	2010	2011	2012	2013	2008-13 CAGR (%)
Americas	69,998.8	73,762.9	79,953.2	87,378.6	96,349.2	105,358.5	8.5
EMEA	21,894.3	23,640.0	25,848.0	28,302.3	30,960.2	33,789.9	9.1
Asia/Pacific	19,489.5	21,544.7	23,870.8	26,502.0	29,384.9	32,630.6	10.9
Worldwide	111,382.7	118,947.6	129,672.0	142,182.9	156,694.4	171,779.0	9.1
Growth	9.1	6.8	9.0	9.6	10.2	9.6	

Source: IDC Worldwide and U.S. Business Process Outsourcing Services 2009-2013 Forecast

Major Markets of the IT-ITes industry

As in IT services, the US and Europe (primarily the UK and Germany) remain the key markets for the Indian ITES sector, accounting for around 90% of Indian exports. Although growth for Indian ITES services has been strong in these markets, Indian firms have also exhibited strong growth recently in supplying services to markets such as Japan, Australia, Canada, and the Netherland. In terms of markets, the US continues to be the main overseas market for India's ITES industry, accounting for nearly two-thirds of the export revenues. Other major markets include Western Europe, accounting for around
20% of the export revenues.

Since 1990s, US firms have increasingly used offshore outsourcing by relocating their labour-intensive service functions to other countries. For instance, a US firm might use a call centre in India to handle customer service related questions. The principal novelty of outsourcing services is the means by which foreign purchases are delivered. Whereas imported goods might arrive by ship, outsourced services are often delivered using telephone 1ines or the Internet. The basic economic forces behind the transactions are however the same. When a good or service is produced more, cheaply abroad, it makes more sense to import than to make or provide it domestically. While cost savings is a, prime factor considered by companies .when deciding to outsource, other
critical factors, such as talent shortages, ability to maintain 24-hour work days, and local market knowledge, also motivate companies to outsource some functions.

Geographic Concentration of the IT- ITES industry in India

The growth of the Indian ITES industry has been concentrated around a few key cities such as the Capital Region, (Delhi, Gurgaon, Noida), Bangalore, Chennai, Hyderabad, and Mumbai. The choice of these cities has been driven by their established air connectivity to international and domestic cities; well-established physical infrastructure (power, water, telecommunication, etc.); availability of well-qualified, adequate and low-cost manpower; and developed social infrastructure to support the residing population. However, higher salaries (and increased aspirations), high attrition, overworked infrastructure, and the cost of infrastructure at these locations appear to be an area of concern for service-providers and clients. There is an emerging trend to minimize this 'cost so that margins may-be maintained and profitability enhanced. Consequently,
Service providers are now increasingly looking beyond the traditionally favored destinations towards new such as Chandigarh, Jaipur, Pune, Indore, Ahmedabad, Trivandrum and Cochin. These cities offer a cost

advantage, given their relatively lower cost of i1ving, and consequently lower employee costs. Since 2005, Government and NASSCOM have been encouraging new entrants to consider locating themselves. Over the next few years, nearly 30% of India's ITES revenues are expected to come from these cities. However, the disadvantages of these cities include higher employee training costs; higher cost of maintaining 24x7 operations because of infrastructural inadequacy; low international and domestic connectivity; and electricity shortages. Thus the shift towards' these new locations may well be slow.

Importance to the Economy

India's share of the global IT-ITES market (including ITES) rose from around 1.7% in 2003-04 to 2.3% in 200405, and further to an estimated 2.8% in 2005-06. The sectors share in the country's gross domestic product(GDP) is projected to increase from around 4% in 2004-05 to 7% by 2007-08.India's foreign exchange reserves have increased significantly over the last few years (estimated at US$151.62billion as of March 31, 2006). Currently, the reserves are sufficient to finance around 13 months of imports. The Indian ITES sector now contributes a small but growing share of trade in invisibles.

Table 5.8 Trends in Indian IT and ITES-BPO Exports and in Foreign Exchange Reserves

US$ billion

	IT-ITES exports	Foreign Exchange Reserves
2000	5	48
2001	7	42
2002	9	55
2003	10	76
2004	15	115
2005	18	140
2006	22	150

The net invisibles surplus of US$28.06 billion during April-December 2005 was reinforced by remittances from expatriate Indians, software exports and travel earnings. Buoyant software exports reflect the initiatives towards market diversification, movement up the value chain, focus on high-end processes, and establishment of R&D centres for clients. There has also been a sharp acceleration in non-software services exports, partly emanating from the underlying dynamism in the export of business and professional services.

Table 5.9 India’s Current Account

US$ billion

	2002-03	2003-04	2004-05	2005-06 (9 months)
Merchandise Balance	-10.69	-13.72	-36.63	-41.53
Invisibles Balance	17.04	27.8	31.23	28.06
Services	3.64	10.14	14.2	15.85
Of which Software	8.86	12.32	16.53	15.08
Transfers	16.84	22.16	20.84	17.15
Income	-3.45	-4.51	-3.81	-4.95
Total Current Account	6.35	14.08	-5.4	-13.48

According to the RBI, net software services exports increased 28.6% (year on year) from US$11.73 billion in April-December 2004, US$15.08 billion in April-December2005. With the ITES sector reporting high growth, export revenues from this sector have increased rapidly from US$2,5 billion in 2002-03 to US$4.6 billion in 2004-05, and to US$6.3 billion in 2005-06. A major impact of this growth has been on employment creation, which has almost doubled every year. The number of professionals employed in India by the ITES sector increased by 0.1 million each during 2004-05 and 2005-06 to an 0.41 million by end-2005-06. India's labour force is expected to increase by 1.5% per annum till 2020, implying an addition of around 130 million.

Employment growth in IT-ITES could provide jobs for a significant part of these additions to the labour force. India accounted for 44-46% of the global ITES market during 2004-05. With only 10% of the potential market tapped so far by all countries put together, the potential for further growth is very large. Given the annual growth rate of over 35%, the Indian ITES industry can generate revenues of around US$26 billion by 2009-10.

Moving up the Value Chain

Revenue realization per employee in the Indian ITES industry has not increased significantly in low value-added segments like customer care over 2002-05, mainly because of slow wage increases in the US economy, from which nearly 70% of the Indian ITES business originates'. More than 60% of the ITES business outsourced to India is voice-related. Barring transcription, voice has the lowest margins. With lower price increases, higher competition, and the increased commoditization of the business, moving up the value chain is an emerging imperative for the industry. Vendors can move up the value

chain vertically. For instance, for a credit card customer, the low-end processes would include services such as data entry and processing of applications, but the higher value jobs would include processes such as credit evaluation and fraud detection. Vendors can also move horizontally, that is expand their services portfolio by moving into sophisticated areas such as US generally accepted. accounting principles (GMP) accounting, certain, engineering services, and consulting.

Table 5.10 Employment and Wages in the US during 2004 in Potential Outsourcing Functions

Function	Number of jobs (million)	Wages& Range
Telemarketers	0.42	US$11.2/hr (US$7-18)
Switchboard Operaters incl. answering service	0.26	US$10.4/hr (US$7.4-15.1)
Book-keeping, accounting, and auditing clerks	2	US$13.7/hr (US$8.9-21)
Bills and account collectors	0.46	US$13.2/hr (US$9.2-20.1)
Billing and posting clerks and machine operators	0.52	US$13/hr (US$9-18.9)
Credit authorisers, checkers, and clerks	0.07	US$14/hr (US$9.2-21.9)
payroll and timekeeping clerks	0.21	US$14.6/hr (US$9.5-21.3)
HR assistants, except payroll and timekeeping	0.17	US$15.3/hr (US$10.2-22)
Medical transcriptionists	0.11	US$13.6/hr (US$9.7-19.6)
Medical records and health information technicians	0.16	US$12.3/hr (US$8.5-20)
Reservation & transportation ticket agents & travel clerks	0.16	US$13.3/hr (US$8.5-21.7)
Financial Analysts	0.36	US$29.8/hr (US$18.1-54.6)
Credit Analysts	0.07	US$22.7/hr (US$13.9-43.9)
Tax Preparers-individual/small business	0.05	US$13.3/hr (US$7.5-29.1)
Law clerks (assist lawyers or judges by researching or preparing	0.04	US$16.3/hr (US$9.22-25.2)

legal documents)

ITES players are realizing that with potential competition from lower-cost countries, traditional manpower cost advantages may not be sustainable over the medium term. They have therefore initiated significant cost control and reduction initiatives, such as efficient utilization of capacity, use of accurate cost planning techniques, and training on cost consciousness. They are also expanding the scope of service delivery to provide so-called knowledge process outsourcing (KPO) services. Unlike in BPO where the focus is on executing standardized routine processes, KPO involves processes that demand advanced information search, analytical, interpretation and technical skills as well as some judgment and decision making. Examples of KPO functions are customer
analytics; market research analysis; Intellectual property or patent research; research outsourcing in pharmaceuticals and biotechnology; data mining; database creation; analytical services such as equity research, competitive
Intelligence, industry reports; and financial modeling.

Moving up the value chain in SPO services is critical to enhancing price realization, improving the stickiness of relationships with customers, and raising profitability. Revenues in KPO are currently in excess of US$20 per hour depending on the function, as compared with around US$8-11 per hour in traditional BPO functions. By comparison, capital expenditure per seat is about the same at US$6,000-$8000.

The global KPO sector is expected to grow at a CAGR of over 45% to around US$17 billion by 2010. KPO is contingent on access to a large, high-quality skill pool. For this reason, KPO operations are likely to emerge in countries with the highest educational standards, providing a large number of highly qualified professionals (engineers, MSAs, PhDs, CFAs, lawyers, etc.), such as India, China and Russia. India, with its highly qualified professionals (who are also comfortable communicating in English), is emerging as the location of choice for a. wide variety of KPO functions. This may enable the Indian KPO sector attain a size of US$12 billion by 2010.However, selling up successful KPO companies is difficult and there are significant entry barriers.

Some Indian service providers have also been offering higher value services to customers in the areas of insurance claims processing and equity research support. Many US investment banks, fund management houses and brokerages are outsourcing their financial research to India, citing cost advantages, and the quality and availability of talent here.

The pharmaceutical and life sciences sector is a relatively new sector for India's ITES sector, with significant potential Around 40-45% of health and life sciences companies outsource some business, including learning and training, HR, F&A, and customer relations. Future areas of outsourcing include core functions of drug discovery and development. Recognizing the potential in this segment, several ITES. Companies (including domain specialist biotech and pharmaceuticals firms) are endeavoring to increase their presence in the segment.

Legal services are another relatively new segment that has drawn interest recently and holds significant potential. Several legal departments of MNCs, legal publication companies, and legal research firms are now outsourcing some services from India. The range of processes being outsourced has moved up from transcription, secretarial support, word processing, and secretarial work to higher value activities such as contract review, patent writing, litigation support, legal claims processing, and general research and review.

Chapter 6

SUMMARY AND CONCLUSIONS

We have tried to understand the software industry in common economic terminology.
*The uses, users, products and producers of software.
*This has helped us getting insights regarding critical technology, skill, value and risk in the process of software development.
*Indian software ventures are generally categorized as low value/ low skill activities.
* But now the industry is moving up the value chain.
*Locate the position of the Indian software industry in the context of global software capability.
*It is found that embedded software is the critical segment that is closely linked with the manufacturing (capital and consumer goods) industry – the backbone of industrial strength of any country.
* Embedded software is the key to production efficiency through industrial automation and also essential element for developing products (capital goods and consumer goods) with intelligent, reliable and precision functions that can add high value and create competitive advantage.
*Perennially laggard in capital goods industry, the neglect of embedded software segment has pushed Indian capital goods sector further backward.

Low value/ low skill activities have created a structure of the Indian software industry that is quite similar to the other sectors of the Indian industries.
*Technological competitiveness not being the dynamics of such an industry, it is quite distant to think that the industry would ever be able to find its own high skill/ high value niche, unless there is any strategic intervention in this regard.
*Policy initiatives, however, mainly focused on maximizing export earning based on existing areas of activities by strengthening necessary administrative and technological infrastructure along with critical fiscal incentives.
* Even though industrial automation is a politically sensitive issue, it provides the greatest potential scope not only for software supremacy but also for industrial supremacy of India.

Distribution of number of technical training attended in a year
57.2 percent of the respondents attended 0-2 trainings in a year, where as 31 percent undergone 3-5 trainings and 6-8 and 9-12 number of trainings were undergone by 9.0 percent and 1.3%.

Distribution of number of soft skills trainings attended in a year
In the case of soft skills trainings 82.5% of the IT professionals have gone through a minimum of 0-2 number of trainings,13.0% of the total respondents done 3-5 trainings and 5% undergone 6-10 trainings in a year.

Distribution related to the trainings and competency
As the respondents are under going too much trainings in a year here we checked how good the trainings are in developing competency in the IT professionals. It is evident from the table that 58.9% of females confirmed that they are always getting more competent, were as 41.1% of the males do. Where as 34% of the females and 41% of the males are getting competency almost in all trainings.
12.6% and 11.4% responded that they are not upgrading with trainings. In the chi-square analysis there is no significant relationship between gender and competency in trainings.

Distribution related to favourable aptitudes to computers & software
It is always being allegated that women are having less aptitudes to computers and software. The study gives evidence that women are showing more aptitudes to computers and softwares with 34.5% and 28.9% responded that they always and very frequently found themselves good aptitudes where as 31.1% and 44.4% responded from the male category. 26.1% of females and 15.6% of males confirmed that they found themselves with the aptitudes sometimes. Out of the total respondents 10.6% and 9.9% of females and males found that don't have aptitude to computers and software. In the chi-square analysis it is found that there is no significant relationship between gender and favourable aptitudes to computers and software.

Distribution related to the multitasking at work
The studies have shown that software industry employees are very much stressed and doing multitasking at work. The survey found that 40% of the respondents from each category assigned multitasking at work. Where as 19.3% and 11.1% of females and males are not getting multitasking at work. 40.7% of the females and 42.7% of the males are getting multitasking at work sometimes. But there is no significant relationship between gender and multitasking at work.

Distribution related to emotional depletion at work
Employees found themselves emotionally depleted at work is a very common phenomenon in the corporate world. The study found that 14.9% of females and 12.3% of the males agreed that they are emotionally depleted at work always. 42.2% of females and 46.1% of males are not emotionally depleted at work. But 42.3% females and 41.6% of males are emotionally depleted sometimes at work. But the chi-square analysis shown that there is no significant relationship between gender and emotional depletion at work.

Distribution related to promotions at work
Gender and promotions at work, the study observed that 9.2% females and 8.3% males are getting promotion as it required. 17.6% of females and 27.4% of males are getting promotions. 35.1% of females and 21.4% of males responded that they are not getting promotions at all. But still the chi-square analysis shown that there is no significant relationship between gender and promotions at work.

Distribution related to the software production modules
It is highly argued by the academicians that software productions are very much fragmented. It is found that 56.9% of females responded that there is no such fragmentation in the work process, where as 43.1% agreed that fragmentation do exist in the industry. In the case of males 52.3% agreed that fragmentation exists and 46.5% disagreed. The chi-square analysis found that there is no significant relationship between gender and the work process.

Distribution related to the salary of respondents

Differential in salary is a very common phenomenon in the unorganized sector. Here in the study it is observed that 38.8% of females agreed that they don't have salary in par with their male counter parts, where as 61.2% of the females agreed with it. In the case of male respondents 68.6% agreed that they are getting salary in par. But the chi-square relationship shown that there is no significant relationship between the gender and salary of respondents.

Distribution related to the promotion at work

Promotion in carrier is another attribute related to the work status. 28.3% of females confess that they are not getting promotions as it supposed to be, where as 22.4% of males agreed with it. 77.6% of males agreed that they are getting promotions as it is supposed to be. Where as 71.7% agreed with this. The chi-square analysis found that there is no significant relationship between gender and promotion at work.

Distribution related to the recognition at work

Recognition at work is another parameter which decides the work status. 18.85 of females agreed that they are not getting promotions as it required where as 10.3% of males are of the same opinion. 89.7% of males are satisfied with the recognition at work and 81.2% of the females are also agreed with it. There is significant relationship between gender and recognition at work as the chi-square analysis explained.

Distribution related to appreciation at work

Appreciation at work is a major parameter which decides the work status. In the study it is found that 16% of females doesn't have appreciation at work. Where as 14.0% males also agreed the same. 84.1% of females and 86.0% of male confirms that they are having appreciation at work. In the chi-square analysis it is found that there is no significant relationship between gender and appreciation at work.

Distribution related to Creative contributions at work

Work status also decided whether the employees creative contributions at work are including or not. 21.3% females responded that their creative contributions are not being considered. 17.3% males also agreed with this. 89.3% of males and 78.7% females are happy that their creative ideas are being used at work. In the chi-square analysis it is found that there is significant relationship between gender and creative contributions at work.

Distribution related to Work- Life tensions at work

To know more about the stress at work, in the study it is observed how the Work-Life tensions is. It is found that 54.9% of females agreed that they do have Work-Life tensions, where as 47.1% of men agreed with it. 45.1% of females and 52.9% males confirmed that there is no Work-Life tensions affecting them. The chi-square analysis found that there is no significant relationship between gender and Work-Life tension at work.

Distribution related professional Incentives

Another important parameter which decides the satisfaction at work and work status is professional incentives. It is found that 18.7% of females and 20.5% males agreed that they are getting professional incentives.33.7% of males found that they are getting professional incentives very frequently, where as 20.1% females do agree. 22.4% of females confirmed that they are not getting professional incentives. Where as 19.2% of males do agree. But the chi-square analysis found that there is no significant relationship between gender and professional incentives.

Distribution related to Decisions at Work

Work status and decisions at work are highly correlated. It is found in the study that 34.4% of females and 34.1% of males agreed that they are part of decisions at work. Where as 65.1% of females and 61.0% of males found that they are not related to decisions at work. In the chi-square analysis it is found that there is no significant relationship between gender and decisions at work.

Distribution related to Stress at work
Stress at work is an important attribute to look at the job satisfaction, work status, stress and quality of a person's life. 25.9% of females agreed that they have stress at work where as 17.2% of males confirmed it. 29.4% of females and 36.85 of males respond that they don't have stress at work. Where as 44.8% and 46.0% of females and males agreed that they have stress at sometimes. The chi-square analysis confirmed that there is no significant relationship between gender and stress at work.

Distribution related to Stress in family
Stress in work affect the family and again stress in the family affect stress at work. It is found in the study that 16.3% of females do have stress where as equal percent of males do. 48.9% females and 54.0% of males agreed that they don't have stress at all, where as 34.8% and 26.7% of females have stress in family sometimes. But in the chi-square analysis it is found that there is no significant relationship between gender and stress in family.

Distribution related to daily stress
Daily stress is the cumulative effect of stress in family and stress at work. 17.6% of females and 20.0% of males agreed that they do have stress in a daily basis where as 82.2% of females and 79.7% of males respond that they don't have stress on a daily basis. The chi-square analysis found that there is no significant relationship between gender and daily stress.

Distribution related display of anger
In the case of display of anger how do men and women differ that is analysed in this question. 47.6% of females and 69.9% of males responded that they won't display anger. Where as 52.4% of females and 30.0% of males agreed that they do display anger. In the chi-square analysis it is found that there is significant relationship between gender and display of anger.

Distribution related to additional job
To understand the nature of the employees, to check the work-holic attitude, it is helpful to know whether they are doing any additional job. 82.6% of females and 75.6% males responded that they are not doing any additional job, where as 17.4% of females and 24.4% males do have additional jobs.

Distribution on job quit of family commitments
To check how the family commitments and quitting a job relates, if is found that. 72.7% of females and 60.7% of males agrees that they haven't quit job for family commitments where as 27.3% of females and 39.3% of males quit jobs for family. The chi-square analysis found that there is significant relationship between gender and job quit for family commitments.

Distribution related to Job Satisfaction
It is found that 20.5% females and 19.3% male don't have job satisfaction where as 79.5% and 80.7% of females and males have job satisfaction. In chi-square analysis there is no significant relationship between gender and job satisfaction.

Distribution related Job insecurity
In the case of job insecurity 36.2% females and 42.0% males have job insecurity where as 63.8% of females and 58.0% males do have job insecurity. In the chi-square analysis there is no significant relationship between job insecurity and gender.

Distribution related to mode of travel to work
Mode of travel signifies the freedom to move. It is found that 41.6% and 17.6% of females use company cabs and public transportation, where as 24.8% of females are using on vehicles. 54.4%

of males are using on vehicle and 26.5% and 13.2% are using company cabs and public transportation respectively. In the chi-square analysis it is found that there is significant relationship between gender and mode of travel.

Distribution related to mode Personal Travel
In the case of personal travel 61.1% of females and 76.5% of males use personal vehicles, the rest say 24.2% and 23.5% use public transportation as their mode of personal travel. But in the chi-square analysis there is no significant relationship between gender and mode of personal travel.

Distribution related to flexible office hours
In the case of flexible office hours 13.1% of females and 19.8% of males responded that they don't have flexibility in office hours. Where as 86.9% of females and 80.2% of males agreed with it. But it is found that there is no significant relationship between gender and flexibility in office hours.

Distribution related to part time working facility
In the case of part time working facility 83.6% of females and 87.8% of males responded that they don't have part time working facility, where as 16.4% and 12.2% agreed that they do have. But in the chi-square analysis there is no significant relationship between gender and part time working facility.

Distribution related to working at home
73.0% of females and 72.0% of males responded that they don't have working at home facility. Where as 27.0% of females and 28.0% males do have. In the chi-square analysis there is no significant relationship between gender and working at home facility.

Distribution related to adequate Maternity Leave
27.7% of females and 44.0% of males responded that maternity leave is not adequate, where as 72.3% of females and 56.0% males are happy with the maternity leave facility.

Distribution related to adequate paternity leave

In the case of paternity leave 36.8% of females and 27.3% of males are not happy with it where as 63.2% of females and 72.7% of males are contended with that they have.

39.1% of females and 30.0% of males agreed that they don't take timely healthcare to themselves where as 11.1% females and 13.3% males occasionally did. Surprisingly 4.1% females never did any health care to themselves. 45.9% females and 56.7% males responded that they sometimes address their health care issue. There is no significant relationship in the chi-square analysis among gender and timely health care

- 10.4% females and 14.6% males did occasional health care to their family. 53.8% females and 39.4% males do give health care to family. It can observed that 15% males are still lagging behind in giving health care to family. 35.2% females and 44.9% males are occasionally dealt with the family health care. But there is no significant relationship found in gender and timely health care.

- Food on time is an important attribute in the health status of a person. 12.3% females and 10.1% males failed to take food on time, where as 27.3% and 36.0% of females and males are taking their food 'sometimes' on time. Where as 60.0% females and 53.9% males do take food on time. But in the chi-square analysis there is a significant relationship between gender and their food habits.

- Regular medical check up is an attribute to of health index. 48.9% of females and 43.9% males hardly do medical check up, where as only 18.7% of females and 12.3% of males do regular medical check up. Where as 32.4% and 43.8% done the check up sometimes. But in the chi-square analysis there is no significant relationship between gender and regular check up.

- 19.2 of females and 14.4% of males found themselves in a regular unhealthy mode of course, unhealthy mode is a direct indication of absence of health. 39.7% of females and 48.9% of males found that they are in a good health condition always, where as 41.1% of females and 36.2% males responded that at times they found that they are in a quite unhealthy mode.

- 11.1% of females and 13.8% of males end up in taking medical help. Medical help is indicating a emergency health condition. 51.1% of females and 55.1% of males hardly took any medical care and thus healthy. 37.8% of females and 31.0% of males, do take medical care and respond that they are unhealthy sometimes. In th chi-square analysis there is no significant relationship between gender and emergency health condition.

- 3.0% of females got hospitalized 4 times in six months, 6.1% of females and 6.3% of males took the hospital facility 2 times in six months. Where 60.6% of females and 62.5% males are hospitalized once in six months. 30.3% of females and 31.3% males haven't hospitalized at all in the last six months. But there is no significant relationship between gender and hospitalization.

- Networking with colleagues is very important attribute in socialisation. 60.4% females and 62.8% males do part of networking with their colleagues, where as 9.0% of females and 10.5% of males hardly do. 30.6% of females and 26.7% of males do networking with the colleagues sometimes. In the chi-square analysis there is no significant relationship between gender and socialisation with in the company.

- 13.3% of females and 10.2% of males hardly visit their friends and relatives. 30.8% of females and 26.1% of males do network in their social circle sometimes. 56.0% of females and 63.6% of males do network with their real and dear ones. There is no significant relationship between gender and networking with friends and relatives in chi-square analysis.

- Membership in any social organization is a strong indication of socio-political involvement. 79.2% of females and 79.3% of males don't have any sort of connection in any social organization, Where as 20.8% of females and 20.7% of males do have membership in social organization. In chi-square analysis there is no significant relationship between gender and membership in any social organization.

- Involvement in social activity is a clear indication of socio-political involvement. 60.0% of females and 56.3% of males don't have any social activity. Where as 40.0% of females and 43.7% of males do have social activities in life. But in the chi-square analysis there is no significant relationship between gender and involvement in social activity.

- 29.7% of female and 17.0% of males don't read newspapers regularly which is a clear indication of disinterest in social and political issues, where as 69.7% of females and 83.0% of males do read. In the chi-square analysis there is significant relationship between gender and reading news paper.

- 19.1% females and 11.1% males don't vote in election where as 80.1% females and 88.9% do vote. There is significant relationship in chi-square analysis.

- In case of hobbies there is no hobbies for 11.3% of females and 9.1% of males don't have any hobby, where as 88.7% of females and 90.9% males do have. But in chi-square analysis there is no significant relationship between gender and hobby.

- Work-Life conflict is again an indication of high stress in life. 29.9% of females and 14.4% of males do have work life conflict where as 69.4% and 85.6% don't have work-life conflict. In chi-square analysis there is significant relationship between gender and work-life conflict.

- Satisfaction in family life is a clear indication of peace in mind. 3.0% of females and 5.3% males don't have family life satisfaction where as 97.0% of females and 94.7% of males do have. In chi-square analysis there is no significant relationship between gender and family life satisfaction.
- Security in society is a strong attribute of social attrocity. 31.0% of females and 48.9% males responded that social attrocity haven't increased heavily where as 69.0% females and 50.0% males found that social insecurity have increased. In chi-square analysis it is found that there is significant relationship between gender and security in society.

- 69.4% of females and 56. Males responded that they are worried and 29.9% of females and 43.7% of males aren't worried and in chi-square analysis there is significant relationship between gender and worried natures.

- 36.6% of females and 20.7% of males respond that they can't prevent any attacks and so in secured, where as 62.7% of female and 79.3% of males respond that they are in a better situation. In chi-square analysis there is significant relationship between gender and prevention of social attack.

- Scared to travel during night, 66.4% of females and 12.4% of males scared to travel at night. Where as 33.6% of female and 87.6% of male not scared and ready to travel during night. In chi-square analysis there is significant relationship between gender and scared nature to travel at night.

- Attrocities during journey,45.4% of females and 21.4% of males responded there is Where as 54.6% of females and 78.6% of males found no attrocity during journey. The relationship is highly significant between gender and attrocity during journey.

Summary of the empirical results

- Wilcoxon - Mann/Whitney Test for **Decision making Index** the P value is highly significant among the two group of males and females, shows there is significance of the two indices.
- Wilcoxon - Mann/Whitney Test for **quality of life Index** the P value is highly significant among the two group of males and females, shows there is significance of the two indices.

- Wilcoxon - Mann/Whitney Test for **Job Satisfaction Index** the P value is not highly significant among the two group of males and females, shows there is no significance of the two indices.

POLICY IMPLICATIONS

We have indicated that the embedded software segment holds the key to the supremacy in software market. The embedded software segment also provides the missing link between the software and hardware of computing technology because successful development of embedded software needs matching computer hardware technology skill. Innovative application of microelectronics has revolutionized the manufacturing industries of the developed countries. Newly industrialized countries also followed the same path for building up competitive advantage through strategic application of microelectronic devices in their manufactured consumer goods. This is the area of embedded software that has to be coupled with hardware technology for innovative industrial applications.

Most visible policy intervention from government of India and a few state governments has been in the form of setting up software technology parks. This is in addition to various fiscal and other regulatory **incentives for attracting new investment and making the process of setting up new ventures easier withi**n and outside the country.

The Task Force and its various working groups, including one on IT Research, Design and Development and another on IT Human Resource Development appear to be oblivious of the importance of domestic base of the software industry. In the light of the above discussion, it is the embedded software segment that holds the key to technological competence of the software industry. We have also argued that embedded software is closely linked with the capital goods sector and also with industrial automation. The latter part has always been a politically sensitive issue in the country and always has been seen as an anti-labour device. In today's context, the same appears to be the most promising area for using and developing software capability at the most critical area that has the potentiality to modernize our capital goods industry, enhance industrial productivity through industrial automation, create employment opportunity both in the resurgent capital goods sector and the IT sector.

Software technology parks with their modern infrastructure with other policy packages might have helped increasing export earning in the existing types of product and services. What has been totally neglected is the critical technological capability part in the high value/ high risk activities. For a long run consolidation of software supremacy IT has to be coupled with the domestic production system. This can create a formidable international supremacy in other industries as well. Only STP might be just trading the long-term benefit for short-term gains.

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Questionnaire

General Details

Gender	:	Female/Male/No gender
Age	:	
Educational Qualifications	:	
Religion	:	Hindu/Christian/Muslim/Others
Caste	:	Forward Caste/Backward caste/Others
Relationship Status	:	Single/Married/Separated/Living together/ Don't Want Marriage
Age at Marriage	:	
Number of kids	:	0/1/2/3/4

Your Family

Age of your spouse	:	
His/Her Educational Background	:	
Is he/she employed	:	Yes/No
If Yes Income	:	[10,000≤,11k-25k,26k-50k,51k-75K,75k-1 lakh,1 Lakh >]
Living Arrangements	:	Rent /P.G/Home/Own Flat/Wt relatives
Size of your family	:	2 / 2-4/ 4-6 / 6>
Father's Education	:	
Father's Occupation	:	Govt/Private/Business (Small, Medium, Big)/ Labour/No
Mother's Education	:	
Mother's Occupation	:	Govt/Private/Business (Small, Medium, Big)/ Labour/ House Wife
Which income group will you include your parental family	:	Low / Middle / High

Decision Making

Do you have hold in the decision making of the following	Yes/No	If No, Specify.
Slecting Spouse	Yes/No	
Number of kids	Yes/No	
Age gap of Kids	Yes/No	
Schooling the kids	Yes/No	
Spending your income	Yes/No	
Regular Purchase	Yes/No	
Visit friends & relatives	Yes/No	
Spending the leisure time	Yes/No	
Spending holidays	Yes/No	
Obtaining health care for self	Yes/No	

Day to Day Time Utilisation:

Working hours	Working hrs at home	Leisure hrs	Sleeping hrs	Travelling hours

Do you entrust your monthly income with your spouse: Yes/No
If Yes: Fully /Partially
Discharge of Household Activities : Self/Spouse/joint/Servant/Parents/In-laws

Assets Holdings:

Life Time Investments	Ownership of Assets -	Decision Making **[Coding – Self 1, Spouse2,Joint-3, Parents -4, Inlaws-5,Kids-6]**
Home /Flat	Self/Spouse/Joint/kids/Others	1/2/3/4/5/6
Vehicles 1.	Self/Spouse/Joint/kids/Others	1/2/3/4/5/6
2.	Self/Spouse/Joint/kids/Others	1/2/3/4/5/6
3.	Self/Spouse/Joint/kids/Others	1/2/3/4/5/6
Other Properties (Land, Buildings)1.	Self/Spouse/Joint/kids/Others	1/2/3/4/5/6
2.		1/2/3/4/5/6
3.		1/2/3/4/5/6
Savings	Self/Spouse/Joint/kids/Others	1/2/3/4/5/6
Insurance Schemes	Self/Spouse/Joint/kids/Others	1/2/3/4/5/6
Stocks & Shares	Self/Spouse/Joint/kids/Others	1/2/3/4/5/6
Gold	Self/Spouse/Joint/kids/Others	1/2/3/4/5/6
Others, Specify	Self/Spouse/Joint/kids/Others	1/2/3/4/5/6

Monthly Savings : Yes/No [10,000≤ ,11k-25k,26k-50k ,51k- 75K , 75k-One lakh]
Monthly Loans : Yes/No [10,000≤,11k-25k,26k-50k ,51k- 75K , 75k-One lakh]

Employment Related

Selection Process : Campus Interview/friends& relatives/Apply Directly
Is your job is in tune with your basic qualifications : Yes/No

Details of Jobs:

Job I	Designation	Income	Years of Experience (Excluding Onsite)	Onsite Experience	Reason to leave	Break in Service
Job II						
Job III						
Job IV						
Job V						
Job VI						
Job VII						
Job VIII						
Job IX						
Job X						

Current Designation :
If you are in the managing side : Top Management/Middle Management/NA
What is your first priority to stay back in a job:
Income /job satisfaction/Work environment/Location of family/Exposure/
Upgrading the skills/Networking/Social Status/Status of the company
What are you most valuing in your Career.
Being employed/Job satisfaction/Income/Upgrading the skills/Networking/
Status of the company
Average number of trainings attended in a year : Technical ☐ Soft Skills ☐

Scaling for the questions given below:
1=Always, 2=Very frequently,3=Some times, 4=Occasionally, 5=Never

How often the trainings makes you more competent at work : 1/2/3/4/5
Do you have favourable apttitudes to Computers & Software related jobs : 1/2/3/4/5
How often you are getting multi tasking at work : 1/2/3/4/5
Do you often find yourself emotionally depleted at work : 1/2/3/4/5

Are you getting promotions as it supposed to be. 1/2/3/4/5
Do you think the Software production modules are too short that the one don't know the whole Project : Yes/No
Is your salary is in par with your with your counterparts : Yes/No
Is your chance of promotion is par with the Counterparts : Yes/No
Do you get recognition at work as do your counterparts : Yes/No
Does your chance of being appreciated do same with your counterparts : Yes/No
Do your chances of being part of innovative/Creative contributions to work same with your counterparts : Yes/No
Does your Work-Life tensions affect your involvement at work : Yes/No
Do you often enjoy professional incentives same as your counterparts : 1/2/3/4/5
Do you usually participate in 'Work decisions' on the Job : 1/2/3/4/5
How will you rate your Stress at work : 1/2/3/4/5
How will you rate your stress in family : 1/2/3/4/5
Do you feel stressful on a daily basis : Yes/No
Do you display anger : Yes/No
Are you doing any additional Job : Yes/No
Do you ever quit any assignments because of family commitments : Yes/No
Do you have job satisfaction : Yes/No
Do you have job insecurity : Yes/No
Travel to Work (Dominant Use) :
Own Vehicle/Company Cab/Rented/Public Transportation/Partner will Drop/Wt friends
Personal Travel (Dominant Use) :
Own Vehicle/Rented/Public Transportation/Wt Partner/wt Friends
Do you have

At Work	Yes	No
Flexible office hours		
Part time working facility		
Working at home		
Adequate maternity leave		
Paternity leave (father)		

Health Information

How often can you give timely health care to yourself : 1/2/3/4/5
How often can you give timely health care to family : 1/2/3/4/5
How often can you take food on time : 1/2/3/4/5
How often do you take regular medical Check up : 1/2/3/4/5
How often do you find yourself in unhealthy mode : 1/2/3/4/5
How often do you end up in taking any medical help : 1/2/3/4/5
How often do you being hospitalised : In last six months ☐ In last one year ☐

Socio Political Involvement

Networking (Mixing) with colleagues in the company : 1/2/3/4/5
Networking (Mixing) with friends & relatives outside the company : 1/2/3/4/5
Are you a member of any social organization : Yes/No
Do you involved in any social activities : Yes/No
Regular reading of News Paper /Magazines : Yes/No
Do you Vote in Elections : Yes/No
Any hobbies : Yes/No
Rank you needs/priorities to take leave:
For [Spouse ☐ Kids ☐Parents ☐n-Laws ☐Holidays ☐elf S☐k Ot☐rs] ☐

Opinions

Do you face any work–life conflict : Yes/No

Do you have any disagreements with your spouse in money matters: Yes/No

Do women get respect and justice as men	:	Yes/No
Do you believe/live up to Social Expectations:		Yes/No
Are you satisfied in your Family life	:	Yes/No

Atrocities

What do you think of security in Society	:	Increased/Not increased
Worry about critical life situations	:	Worried / Not Worried
Preventing physical attack	:	Can Prevent /Can not prevent
Scare in travelling during night	:	Scared /Not Scared
Atrocities during Journey	:	Yes/No
Existing Legal system	:	Sufficient/Not sufficient

Gender Specific

Age at first child birth	:	
Abortions	:	Spontaneous /Induced/Still birth
Do you think your Communicative /Interactive skills and caring characteristics are valued at work	:	Yes/No
Who is taking decisions in your family (Dominantly)	:	----------
Do you have support from family	:	Yes/No
Emotional Security at home	:	Yes/No
Do you get medical & personal care in emergency at home	:	Yes/No
Is your chances of acquiring additional qualification same as males	:	Yes/No
Is it fine to discuss sexual issues frankly	:	Yes/No
Do you have the same social relations as the men has	:	Yes/No
As you have more responsibilities & Obligations at home did you find yourself fitting in to less complicated job (Easy going type)	:	Yes/No
Do you have the same mobility as males	:	Yes/No
Reasons for going job	:	Own Interest/Family Income/Time Pass/Compulsion/Social Status/to be creative/to do service

Thank you

Empirical Results of Regression Analysis.

$\hat{Y}i$ = -23.979 + 2.8694D_1 + 2.32825 D_2 + 0.231475P_E + 2.69834E_R - 0.0000026(I)

Std. Error (28.9.99) (4.07854) (4.02883) (0.173055) (1.83565) 0.0000026

t-ratio (-0.8294) (0.7036) (0.5779) (1.3376) (1.4700) (-0.9850)

p-value (0.40771) (0.48241 (0.56389) (0.18234) (0.14293) (0.32563)

$\hat{Y}_i$ = -23.979 + 2.8694 + 2.32825 + 0.231475P_E + 2.69834E_R -0.0000026(I)

$\hat{Y}_i$ = -23.979 + 2.8694 + 0.231475P_E + 2.69834E_R -0.0000026(I)

$\hat{Y}_i$ = -23.979 + 0.231475P_E + 2.69834E_R -0.0000026(I)

$\hat{Y}_i$ = -23.979 + 2.32825 + 0.231475P_E + 2.69834E_R -0.0000026(I)

Co-efficient in the regression analysis, in the case of Single Male the empowerment Index is more , where as the female married is showing poor index value, the male married and the female married are showing the index value next to the Married Female

R-squared	0.029334
F(5, 232)	1.402241

Adjusted R-squared	0.008415
P-value(F)	0.224251

The R- Squared value is low and thus the adjusted R Square and F Value , So the overall significance the model is strongly questioned. The P value is also not valid.

Regression Analysis with Decision Making Index

Y_i = 30.4052 + 16.3177D_1 -22.4176 D_2 + 0.0107004 P_E + 3.13172E_R -0.0000022(I)

Dependent variable: Decision_Making_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	30.4052	27.3105	1.1133	0.26673	
Dummy One	16.3177	3.85291	4.2352	0.00003	***
Dummy Two	-22.4176	3.80594	-5.8902	<0.00001	***
Father_Mother_s_Edun	0.0107004	0.163481	0.0655	0.94787	
Yrs_f_Edn_f_Respondent	3.13172	1.7341	1.8060	0.07222	*
Generated_Income	2.17944e-05	2.49551e-05	0.8733	0.38338	

$\hat{Y}_i$ = 30.4052 + 16.3177 -22.4176 + 0.0107004 P_E + 3.13172E_R -0.0000022(I)

$\hat{Y}_i$ = 30.4052 + 16.3177 + 0.0107004 P_E + 3.13172E_R -0.0000022(I)

$\hat{Y}_i$ = 30.4052 + 0.0107004 P_E + 3.13172E_R -0.0000022(I)

$\hat{Y}_i$ = 30.4052 + -22.4176 + 0.0107004 P_E + 3.13172E_R -0.0000022(I)

Co-efficient in the regression analysis, in the case of Single Male the Decision Index is less than the case of a Married Male the category which have high decision making index , where as the female married is showing a better index value, than the single female. In short the regression coefficient is high for married male then to married females, where as single males followed the index value position.

The dummy variables gender and marital status are highly significant in the model with 1% level of significant. Where as years of education of the respondent is also valid position in the regression model of decision making index with 10% level of significance.

R-squared	0.200317	Adjusted R-squared	0.183083
F(5, 232)	11.62300	P-value(F)	0.000000

The R- R-squared value shows that , dependent variable is 20% explained by the

Independent variables in the model. The P Value is also highly significant, which shows the overall significance of the model.

Regression Analysis with Decision Health Index

Health Index

$\hat{Y}_i$ = -34.5411-8.55976D_1 -7.09195D_2 + 0.039803P_E + 1.96644E_R -0.0000081(I)

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-34.5411	49.6372	-0.6959	0.48721	
Dummy_One	-8.55976	7.0027	-1.2223	0.22282	
Dummy_Two	-7.09195	6.91735	-1.0252	0.30632	
Father_Mother_s_Edun	0.039803	0.297129	0.1340	0.89355	
Yrs_f_Edn_f_Respondent	1.96644	3.15175	0.6239	0.53329	
Generated_Income	-0.0000081	0.0000045	-1.7901	0.07474	*

$\hat{Y}_i$ = -34.5411-8.55976 -7.09195 + 0.039803P_E + 1.96644E_R -0.0000081(I)

$\hat{Y}_i$ = -34.5411-8.55976+ 0.039803P_E + 1.96644E_R -0.0000081(I)

$\hat{Y}_i$ = -34.5411+ 0.039803P_E + 1.96644E_R -0.0000081(I)

$\hat{Y}_i$ = -34.5411-7.09195+ 0.039803P_E + 1.96644E_R -0.0000081(I)

The regression results shows that very poor health index is for single male and then married male. A better index is for married female. The variable Income is highly significant in this model of the regression of health index.

R-squared	0.023902
F(5, 232)	1.136206

Adjusted R-squared	0.002865
P-value(F)	0.341914

The R-squared value is very low , thus the F value and P value which shows that the overall significance of the model is too low.

Regression Analysis with Attrocity Index

$\hat{Y}_i$ = -146.878+46.9461 D_1+ 11.786 D_2 -0.205482 P_R + 7.73217E_R -0.0000017(I)

Dependent variable: Atrocity_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-146.878	45.2017	-3.2494	0.00133	***
Dummy_One	46.9461	6.37696	7.3618	<0.00001	***
Dummy_Two	11.786	6.29923	1.8710	0.06260	*
Father_Mother_s_Edun	-0.205482	0.270578	-0.7594	0.44837	
Yrs_f_Edn_f_Respondent	7.73217	2.87011	2.6940	0.00758	***
Generated_Income	-1.79588e-05	4.13032e-05	-0.4348	0.66411	

$\hat{Y}_i$ = -146.878+46.9461 + 11.786 -0.205482 P_R + 7.73217E_R -0.0000017(I)

$\hat{Y}_i$ = -146.878+46.9461 -0.205482 P_R + 7.73217E_R -0.0000017(I)

$\hat{Y}_i$ = -146.878 -0.205482 P_R + 7.73217E_R -0.0000017(I)

$\hat{Y}_i$ = -146.878+ + 11.786 -0.205482 P_R + 7.73217E_R -0.0000017(I)

The regression results are showing better coefficients for male single then to male married, atrocity is high for married female than of the single female. The dummy variable gender is showing a significant variable in this case of atrocity , for 1% level of siginificance. The dummy two marital status is also well explained in the model with 10 % significance level.

Years of education of the respondent is another variable which is showing good explanation in the model, the p value is significant at 10% level

R-squared	0.229030
F(5, 232)	13.78392

Adjusted R-squared	0.212414
P-value(F)	0.000000

The R-squared value is 22% and the P value is highly significant , which is showing the overall significance of the model.

Regression Analysis with Socio-Political Index

$\hat{Y}_i = 7.46832+5.20007\ D_1+ 15.3821D_2 +0.401774P_R + 0.406442E_R -0.0000046(I)$

Model 1: OLS, using observations 1-238
Dependent variable: Socio_Politi_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	7.46832	36.6037	0.2040	0.83851	
Dummy_One	5.20007	5.16397	1.0070	0.31499	
Dummy_Two	15.3821	5.10102	3.0155	0.00285	***
Father_Mother_s_Edun	0.401774	0.21911	1.8337	0.06799	*
Yrs_f_Edn_f_Respondent	0.406442	2.32418	0.1749	0.86133	
Generated_Income	-4.68293e-05	3.34467e-05	-1.4001	0.16281	

$Y_i = 7.46832+5.20007 + 15.3821 +0.401774P_R + 0.406442E_R -0.0000046(I)$

$Y_i = 7.46832+5.20007 +0.401774P_R + 0.406442E_R -0.0000046(I)$

$Y_i = 7.46832+0.401774P_R + 0.406442E_R -0.0000046(I)$

$Y_i = 7.46832 + 15.3821 +0.401774P_R + 0.406442E_R -0.0000046(I)$

The Socio Political Index is high for single male and then comes single female , then the regression coefficients are high for married male and last comes married female.

The dummy two marital status, variable is significant for 1% level of significance. years of education of the parents is another variable which is highly significant for 10% level of significance level.

R-squared	0.071110	Adjusted R-squared	0.051091
F(5, 232)	3.552102	P-value(F)	0.004095

Regression Analysis with Stress Index

$Y_i = -53.2036+9.42761D_1+ 16.296D_2+0.426305\ P_R + 2.56162E_R -0.0000033(I)$

Model 1: OLS, using observations 1-238
Dependent variable: Stress_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
Const	-53.2036	40.0718	-1.3277	0.18558	
Dummy_One	9.42761	5.65324	1.6676	0.09674	*
Dummy_Two	16.296	5.58433	2.9182	0.00387	***
Father_Mother_s_Edun	0.426305	0.23987	1.7772	0.07684	*
Yrs_f_Edn_f_Respondent	2.56162	2.54439	1.0068	0.31509	
Generated_Income	-3.31913e-05	3.66157e-05	-0.9065	0.36562	

$\hat{Y}_i = -53.2036+9.42761+ 16.296+0.426305\ P_R + 2.56162E_R -0.0000033(I)$

$\hat{Y}_i = -53.2036+9.42761+0.426305\ P_R + 2.56162E_R -0.0000033(I)$

$\hat{Y}_i = -53.2036+0.426305\ P_R + 2.56162E_R -0.0000033(I)$

$\hat{Y}_i = -53.2036+ 16.296+0.426305\ P_R + 2.56162E_R -0.0000033(I)$

The regression coefficients are showing that the single male and single female are showing better results for stress index, where as the highly stressed category are married female and then married male.

The dummy variable two , marital status is significant at 1% level , where as gender and parental education are significant at 10% significance level.

R-squared	0.076947
F(5, 232)	3.867995

Adjusted R-squared	0.057054
P-value(F)	0.002190

Regression Analysis with Job Satisfaction Index

$\hat{Y}_i$ = -15.5064-0.809624D_1+ 0.0565115D_2+0.195552P_R + 1.63264E_R -0.0000021(I)

Model 1: OLS, using observations 1-238
Dependent variable: Job_Satisfaction_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-15.5064	27.0409	-0.5734	0.56690	
Dummy One	-0.809624	3.81487	-0.2122	0.83212	
Dummy Two	0.0565115	3.76837	0.0150	0.98805	
Father_Mother_s_ Edun	0.195552	0.161867	1.2081	0.22824	
Yrs_f_Edn_f_Respondent	1.63264	1.71698	0.9509	0.34266	
Generated_Income	2.14809e-06	2.47087e-05	0.0869	0.93080	

R-squared	0.012928
F(5, 232)	0.607738

Adjusted R-squared	-0.008345
P-value(F)	0.694064

Regression Analysis with Work Status Index

$\hat{Y}_i$ = -52.5855+9.83121D_1+ 0.695D_2+0.254528P_R + 5.40027E_R -0.0000032(I)

Model 1: OLS, using observations 1-238
Dependent variable: Work_Status_Index

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-52.5855	48.7836	-1.0779	0.28218	
Dummy_One	9.83121	6.88229	1.4285	0.15450	
Dummy_Two	0.695	6.7984	0.1022	0.91866	
Father_Mother_s_ Edun	0.254528	0.292019	0.8716	0.38432	
Yrs_f_Edn_f_Respondent	5.40027	3.09755	1.7434	0.08259	*
Generated_Income	3.29452e-05	4.45762e-05	0.7391	0.46061	

R-squared	0.033706
F(5, 232)	1.618494

Adjusted R-squared	0.012880
P-value(F)	0.155922

$$Y_i = -37.8344+11.1933D_1+ 2.10088D_2+0.160454P_R + 3.26161E_R -0.0000017(I)$$

Model 1: OLS, using observations 1-238
Dependent variable: PQLI

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-37.8344	21.3404	-1.7729	0.07756	*
Dummy_One	11.1933	3.01066	3.7179	0.00025	***
Dummy_Two	2.10088	2.97396	0.7064	0.48063	
Father_Mother_s_Edun	0.160454	0.127744	1.2561	0.21036	
Yrs_f_Edn_f_Respondent	3.26161	1.35502	2.4071	0.01686	**
Generated_Income	-1.74693e-05	1.94998e-05	-0.8959	0.37125	

R-squared	0.101688
F(5, 232)	5.252405

Adjusted R-squared	0.082327
P-value(F)	0.000137

The quality of life index is highly significant with P value and the overall significance model is good. The variables years of education of respondents is significant at 5% level and dummy one gender is also significant at 1% significance

Trend analysis of growth models

Regression Analysis Of Domestic Software Data

ANOVA table

Source	*SS*	*df*	*MS*	*F*	*p-value*
Regression	4.2503	1	4.2503	674.08	6.99E-14
Residual	0.0946	15	0.0063		
Total	4.3449	16			

Regression output					*confidence interval*	
variables	*coefficients*	*std. error*	*t (df=15)*	*p-value*	*95% lower*	*95% upper*
Intercept	2.6554					
t	0.1021	0.0039	25.963	6.99E-14	0.0937	0.1104

coefficients in terms of the model: ab^x

452.303	= a, beginning value
1.265	= b, growth factor
26.49%	average rate of change

Export

ANOVA table

Source	*SS*	*df*	*MS*	*F*	*p-value*
Regression	8.9027	1	8.9027	113.22	2.19E-08
Residual	1.1794	15	0.0786		
Total	10.0822	16			

Regression output					*confidence interval*	
variables	*coefficients*	*std. error*	*t (df=15)*	*p-value*	*95% lower*	*95% upper*
Intercept	2.6738					
t	0.1477	0.0139	10.641	2.19E-08	0.1181	0.1773

coefficients in terms of the model: ab^x

471.843	= a, beginning value

1.405	= b, growth factor
40.51%	average rate of change

Regression Analysis of Total

ANOVA table					
Source	*SS*	*df*	*MS*	*F*	*p-value*
Regression	6.2689	1	6.2689	822.92	1.61E-14
Residual	0.1143	15	0.0076		
Total	6.3832	16			

Regression output					*confidence interval*	
variables	*coefficients*	*std. error*	*t (df=15)*	*p-value*	*95% lower*	*95% upper*
Intercept	3.0657					
t	0.1240	0.0043	28.687	1.61E-14	0.1147	0.1332

coefficients in terms of the model: ab^x	
1163.380	= a, beginning value
1.330	= b, growth factor
33.03%	average rate of change

The growth models is showing that export of software industry is growing at 40.51% and domestic sector of the industry is growing at 26.49% where as the total is growing by 30.4%

Wilcoxon - Mann/Whitney Test for the Stress Index

n	sum of ranks	
147	16630.5	Females
90	11572.5	Males
237	28203	total

17493.00	expected value
505.35	standard deviation
-1.71	z, corrected for ties

p-value (two-tailed)	.0881

The Wilcoxon - Mann/Whitney Test for the Stress Index is showing that there is no significant different among the gender

Wilcoxon - Mann/Whitney Test for Work Status Index

n	sum of ranks	
147	21468	Female
91	6973	Male
238	28441	total

17566.50	expected value
512.31	standard deviation
7.61	z, corrected for ties
2.64E-14	p-value (two-tailed)

Wilcoxon - Mann/Whitney Test calculated for Attrocity Index

n	sum of ranks	
147	14032.5	Atrocity Index
91	14408.5	Group 2
238	28441	total

17566.50	expected value
511.62	standard deviation
-6.91	z, corrected for ties
4.97E-12	p-value (two-tailed)

Wilcoxon - Mann/Whitney Test for Job Satisfaction

n	sum of ranks	
147	17564.5	Average
91	10876.5	Group 2
238	28441	total

17566.50	expected value
513.38	standard deviation
0.00	z, corrected for ties
.9977	p-value (two-tailed)

Wilcoxon - Mann/Whitney Test for Socio Political Index

n	sum of ranks	
147	16893	Socio-Politi-Index
91	11548	Group 2
238	28441	total

17566.50	expected value
496.88	standard deviation
-1.35	z, corrected for ties
.1756	p-value (two-tailed)

Wilcoxon - Mann/Whitney Test for quality of life Index

n	sum of ranks	
147	15599.5	PQLI
92	13080.5	Group 2
239	28680	total

17640.00	expected value
520.08	standard deviation
-3.92	z, corrected for ties
.0001	p-value (two-tailed)

Wilcoxon - Mann/Whitney Test for Decision making Index

n	sum of ranks	
147	15850	Decision Making Index
91	12591	Group 2
238	28441	total

17566.50	expected value
491.88	standard deviation
-3.49	z, corrected for ties
.0005	p-value (two-tailed)