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Study on

IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY ON DECENT WORK IN PAKISTAN

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Chapter-1

Introduction

Preamble

Information and communications technology (**ICT**) has proven to be the key technology of the past decade. The widespread diffusion of the Internet, of mobile telephony and of broadband networks all demonstrate how pervasive this technology has become. But how precisely does ICT affect economic growth and the efficiency of Governments, public sector organizations, and firms in the private sector? And what are the conditions under which ICT can become a technology that is effective in promoting decent, well-paid employment and enhancing economic performance in the developing economies of the world?

Despite the downturn of the global economy over the past few years and the passing of the Internet bubble, these questions remain important to policy makers. This is because ICT has become a fact of life in all spheres of economic activity. Almost all firms now use computers and most of them have an Internet connection. Moreover, a large share of these firms use computer networks for economic purposes, such as the buying, selling and outsourcing of goods and services. But despite the widespread diffusion of ICT in developing economies (with the singular exception of India), questions remain about the impact of the technology on job-creation and economic growth.

The economic historian, Carlota Perez, traces five boom-and-bust cycles of technological innovation:

- *THE INDUSTRIAL REVOLUTION;*
- *STEAM AND RAILWAYS;*
- *STEEL, ELECTRICITY, AND HEAVY ENGINEERING;*
- *OIL, CARS, AND MASS PRODUCTION;* and finally,
- *INFORMATION & COMMUNICATIONS TECHNOLOGY*

The common denominator in all these eras has been the gradual transfer of related technologies from innovator nations to others that could deliver products and services of these technologies more competitively than their originators by virtue of labor cost advantage. Thus we see that textile manufactures that began in Britain in the sixteenth century first migrated to the new world in eighteenth and nineteenth centuries and then to labor abundant Asian shores in the second half of the 20th century. During the last fifty years, we have seen how labor cost advantage enabled the Japanese car industry to supplant European and American carmakers and how, at the turn of the last century Korean, Taiwanese, and lately the Indian and Chinese became the most cost-competitive in mass production requiring major blue-collar input.

Over the last fifty years, ICT has developed at a breakneck speed. Its first half was dominated by hardware vendors like IBM and Wang. However, the technology has only come into its own with the power of software with dominance of companies like Microsoft. The defining distinction of the new wave is that it is more a provider of services than of tangible goods…whose cost has meanwhile continued to plummet. And whereas the former waves of technology transferred blue-collar work from the innovating nations, ICT holds the promise of transferring much better paid white-collar jobs to nations that may be economically poor but intellectually a fair match for richer nations. Thus, while USA produces 75,000 engineers and technicians a year, India boasts 300,000 and China over half a million. No wonder then that the increasingly complex activities undertaken in the American and British corporate sectors that demand huge ICT related input are being "**outsourced**" to India. The future competitors of **IBM**, **EDS**, and **Accenture** are already discernible in tomorrow's Indian giants like **TCS**, **WIPRO**, and **Infosys**…the three together boast revenues of USD 4.5 billion with their market capitalization of USD 35 billion on Bombay

Stock Exchange (**BSE**) exceeding the USD 25 billion market cap of Pakistan's entire corporate sector likewise quoted on the Karachi Stock Exchange (**KSE**)!

The IT and Business Process Outsourcing (BPO) that is currently being outsourced by North America and UK to lower labor cost destinations like India, China, Philippines, Pakistan, etc. has three distinct revenue segments:

1. Low value work like that of call-centers, data input, telemarketing, and transcribing health insurance claim's…mostly priced at USD 5-6 per hour and together worth as much as 70% of all revenues.
2. Moderately remunerative work related to maintenance of business software and applications, and their technical support. This accounts for another 20% of outsourced revenues. And,
3. High end services like administrating hedge funds, offshore advisory consultancies, and corporate demand planning…the balance 10% of revenues, which are generally being monopolized by the large software houses of Bangalore, India.

Already, the ICT industry is estimated to have global revenues exceeding USD 400 billion. Analysts estimate that the industry is growing at 12-15% per annum, and given the momentum of globalization and economic integration, should be worth USD 2.2 -2.5 trillion by 2020. Pakistan's IT export for 2003-04 stands at 20 million USD.

Pakistan

In Pakistan, ICT is a comparatively recent arrival. Presently, there are around 2,000 mainframe and minicomputers in the country with nearly half of them being in the government sector. Liberal import policy and reduction/removal of duties has led to a burgeoning usage of PCs and servers. It is estimated that nearly half a million PCs are added each year…representing a three-fold increase in annual volume over the decade straddling the 21st Century. Analysts estimate that this rate of growth could very well quadruple by 2010. However, even as IT improves productivity, assists in maintaining quality control, and increases efficiency and cost effectiveness of services in various sectors of Pakistan's economy, its full implications and impact on the labour markets have not yet been methodically studied.

The federal government in Pakistan has laid great emphasis on enhancing the scope and intensity of ICT in a variety of fields. The Government's Information Technology & Telecommunication Division (**ITTD**) has a PKR 550 million (USD 9 million) share in next three years PSDP budget. This is a part of the PKR 6 billion that the federal and provincial governments plan to spend on IT related activities over the same time-frame. A large number of educational and professional institutions have been established in the country for imparting IT education. However, there are serious imbalances at various skill levels. This has led to critical shortages of highly skilled workers, on the one hand and surpluses of white-collar labor force at lower skill levels, on the other. This would require proper policy formulation to avoid mismatches. Indeed no substantial research has been carried out to date on the issues involved in development and implications of ICT. There is only one report on the software houses prepared by Federal Bureau of Statistics

[FBS, 2002]. Reportedly, the Pakistan Software Export Board (**PSEB**) has a budget of PKR 282 million that is currently being spent to generate such a comprehensive report.

Resource Allocations:

On a more comprehensive scale, there are four distinct segments within the country when it comes to allocation of resources for development of the ICT sector:

1. The Federal Government,
2. The Provincial Governments,
3. Semi-autonomous Organizations, and
4. The Private Sector comprised of:
    a) Financial Institutions (banks, insurance companies, exchanges, etc),
    b) Corporate Sector, especially the large companies quoted on stock exchanges,
    c) The education industry (schools, colleges, universities, and technical institutes), and
    d) The mobile telecom companies and ISPs (Mobilink, Paktel, Ufone, Cybernet, Brain Net, etc)

Whereas the Government has made no bones about the critical importance of a nationwide focus on ICT, the abovementioned allocations reflect resource constraints that preclude significant investments in this critical segment. Investments by Provincial Governments and Semi-autonomous bodies need to be researched. However, it can be safely assumed that in terms of percentage of GDP, ratios are likely to be similarly paltry. It is a safe guess, however, that the greatest financial investment in ICT has taken place in the private sector with major input in banks, insurance companies, exchanges, educational institutions, and the telecom industry

(mobile telephony, and internet). This conclusion is based on the fact that these organizations can no longer be functional or competitive without major emphasis on information management and dissemination. But, again, major research is warranted before one can prognosticate with any degree of confidence.

International Labor Organization (**ILO**) has recently started pr eliminary research work to assess the impact of information technology on decent work in the pacific regions. The member Institute of ILO/ Japan Institute of Labour (**JIL**). National Institutes for Labour Studies have been asked to carry out research studies on Impact of Information and Communication Technology on Decent Work in respective countries. Although, ILO has very clear definitions of Decent Work and guidelines on measuring decent work, using statistical indicators, yet it is difficult to exactly quantify scientifically the full impact of ICT on decent work. The following conceptual indicators capture the essence of decent work, which are used to find out the relative impact of ICT on decent Work.

- Employment opportunities
- Unacceptable work
- Adequate earnings and productive work
- Decent hours
- Stability and security work
- Fair treatment
- Safe work
- Social protection
- Balancing work with family life
- Social dialogue and workplace relations
- Enhancing capacities for employment
- Socio-Economic context

Against a paltry ILO-funded budget of USD 3,000, Pakistan Manpower Institute, a member of the ILO/JIL network, undertook a preliminary study to assess the proliferation of ICT, its impact on labor market and decent work in Pakistan. Obviously, with such a resource constraint, any extensive and/or comprehensive study was infeasible. And if meaningful insights need to be derived, a better funded follow-up effort would be required.

Objectives

The purpose of the study on "Impact of Information and Communication Technology on Decent Work in Pakistan" is threefold:

i. To inquire about the proliferation of ICT in the country
ii. To assess the present state of decent work in Pakistan
iii. To analyze the impact of ICT on decent work.

Methodology

The tools of research study comprised, questionnaires for survey, interviews with respondents, discussions with key informants, and collection of related secondary data etc. Primary data in the sample area was collected during 2003-04 through two questionnaires for key informants and respondents respectively. Information collected by key informants proved useful in proceeding further for detailed inquiry in the respective organizations. The questionnaire was filled in by interviewing employees who had experience of IT and non-IT jobs. Respondents were selected, through random sampling, from various sectors in major cities of Pakistan and small localities. However, only sketchy and limited secondary information in published form was available with the official sources.

A time series approach was used to examine the impact of IT on various variables of the study. For purposes of this study, respondents were selected from nine different sectors. A sample of 5-

7 percent employees was drawn for interview from each organization. Likewise, for the purpose of case studies, the sample was drawn from three types of organizations. (I.e. large, medium and small)…those utilizing and those not utilizing IT.

Universe of the Study

In Pakistan, information technology is concentrated primarily in big cities, with some scattered presence in small localities and remote areas. Therefore, two study areas were selected, one each from big cities and smaller localities. It was assumed that the impact of information technology observed in the two sample areas would be representative of similar other parts of the country. Information technology is a wide term and includes various tools and devices. However, **this study is confined to the impact of the use of computers and Internet on the job market and on decent work.**

Limitations of the Study

To determine the impact of ICT on the job market and decent work, it is important to review the temporal growth in the total stock of computers, printers, servers, and related input-output devices and processes associated with IT. However, in the course of field investigation the following four major limitations were experienced:

a) Lack of proper record-keeping as well as suppression of information by target entities was a serious impediment in collecting primary data. Information was mainly based on individual respondent's memory, which vitiated the confidence interval of the conclusions drawn there from.

b) Insufficient experience of respondents in handling the common IT devices, restricted information about impact of IT.

c) The general consensus of technically qualified enumerators and experts was that the impact of ICT on intended variables may differ according to geographical area, nature of organization and intensity of usage. But due to lack of financial resources, sample collection was confined to three big representative cities and a similar number of small / remote localities.

d) For purposes of benchmarking, availability of comprehensive, reliable, and up to date public statistical data is a pre-requisite. Unfortunately, its presence was the exception rather than the rule. However, scanty and scattered data was painstakingly gleaned from limited sources. This was augmented by what could be downloaded from the Internet.

e) Reliable data pertaining to proliferation of IT could not be obtained in respect of key variables such as number of computers, budget allocation, investment in IT, human resource allocation, etc. due to non cooperation / suppression of information on account of fear of tax authority.

Chapter-2

Proliferation of Information Technology in Pakistan

The government has set up an Information Technology & Telecommunication Division (**ITTD**) to devise and adopt short-term and long-term IT policies to meet the goals of development. Apart from assembly of imported components, Pakistan has not yet started manufacturing of IT hardware. However, the Government established a Pakistan Software Export Board (**PSEB**) in 1995 to support and encourage software houses (**SWH**) in Pakistan and in 1997 declared ICT as an industry. Following the advent of Internet in Pakistan, .Software Technology Parks (**STPs**) were setup in early 1996. STPs were introduced where the SWH were provided the required environment to flourish in the international market. The role of PSEB was to create awareness about the new advancements in the field of software development. These software houses are absorbing surplus manpower, as well as making the people conscious of information technology skills. Government of Pakistan has given certain relaxations in taxes to businessmen dealing with computers, hardware and software. Computer related hardware and software are exempt from all kind of taxes and surcharges. Software houses and software production companies have been exempted from corporate income tax on export earnings from software and related components, till 30th June 2016. All these software-producing companies are being given special treatment for taking loans from the commercial banks. Other incentives include the protection of their legal rights by PSEB in case of any piracy or complaints.

Historically speaking, IT is barely 25 years old in Pakistan. In the 1980s some activities started mainly because of accessibility of personal computers to small businesses and home users. Consequently some institutions were established to cater to the needs of the IT users. In the late nineties, Pakistani universities also began taking IT education seriously. The Foundation for

Advanced Science and Technology (**FAST**), the first computer education institution in Pakistan started its first campus in Karachi in 1985 and in Lahore in 1990. Lahore University of Management Sciences (**LUMS**), one of the most prestigious universities of Pakistan, started offering Computer Science degree in 1993. Until 1997, Pakistan had only a few companies exporting softwares and services. Suddenly, with increasing demand for software and IT related services worldwide, hundreds of software houses were setup. In 2001, there were over 664 software houses registered with PSEB. Ninety percent of these SWHs started business on software development and related services and began exporting software to USA and Europe. By late 2001, such exports had touched an annual target of USD 40 million. However, due to the 9/11 crises, Pakistan's ICT industry suffered a severe setback. Business orders shrank and the entire software industry went through a roller coaster ride. Only 443 odd software companies survived during this difficult period. In fact, as noted above, 2003-04 exports were declined to half their level in 2001.

Software developers require high educational background in their respective areas of specialization. This brings us to the key issue of providing the required skills. The curriculum of most of the educational institutions in Pakistan is rather stale. They mostly teach languages which are not commonly used. Even the fee is very high compared to what they actually deliver. As the world is moving towards greater use of Internet, the objective should be to prepare for e-commerce and e-corporations. The country needs personnel who are equipped with technological as well as administrative skill to deal with the emerging needs.

Tele Banking, ATMs and online banking are becoming increasingly popular in the country. With the increase in customers at banks, such facilities improve the quality of services and provide incentives to the clients. There was an impression that introduction of such services may displace

workers in the country. These fears have not come true. Persons with lower skills may loose their jobs but at the same time there will be greater demand for people with higher skill level.

Pakistan's Software Houses

According to Federal Bureau of Statistics (FBS), total number of 664 software houses were registered during 2002, out of these 221 were closed due to overall reduction in exports. FBS selected 278 software houses for the purpose to collect information on the required variables such as employment, education, occupation, gender and earning. The detail of SWHs by major cities in Pakistan is given be low:

Table-2.I

The number of Software Houses by major cities in Pakistan during 2000-01

Cities	Registered	Closed
Pakistan	**664**	**221**
Islamabad	**124**	**18**
Punjab	**248**	**99**
Rawalpindi	38	6
Wah Cant	1	0
Gujrat	2	0
Sialkot	5	3
Faisalabad	7	4
Lahore	188	86
Vehari	1	0
Multan	6	0
Sindh	**285**	**103**
Karachi	283	103
Hyderabad	2	0
N.W.F.P	7	1
Peshawar	5	0
Kohat	1	1
Abbottabad	1	0

Source: Federal Bureau of Statistics, 2002.

In percentage terms, out of the total SWHs, 33.2 percent were closed because of the negative implications of the incident of 9/11. 278 of the surviving SWHs were surveyed by the Federal Bureau of Statistics to collect information on different variables.

The IT industry in Pakistan has not yet achieved sufficient maturity for it to face severe competition in the international market. On the other hand, sufficient data regarding the Information Technology is not available for appropriate policy formation. FBS data displays the following picture of PC's in use in each SWH in major cities of the country.

Table-2.II

Distribution of PC's & PC Servers Installed in SWH by Cities during 2000-01

Major Cities	**Software Houses**	**Computers (PC)**	**Servers (PC)**	**Other Server (PC)**
	Nos.	**Nos.**	**Nos.**	**Nos.**
Pakistan	**278**	**9585**	**742**	**152**
Islamabad	56	2967	166	61
Rawalpindi	20	567	55	4
Lahore	80	2766	227	46
Karachi	103	2946	266	38
Other cities	19	339	28	3

Source: Federal Bureau of Statistics, 2002.

The data indicated that 9,585 computers and 742 severs were available in 278 SWHs in Pakistan. At an average, 34 computers and 3 servers were available for IT activities in each SWH. The data showed that 53, 28, 34 and 28 computers were available in each SWH in Islamabad, Rawalpindi, Lahore and Karachi, respectively. In the remaining small cities, at an average 18 computers were found available in each SWH. It showed that neither the SWHs nor the number of computers available is sufficient in the small localities/cities of Pakistan.

The information regarding the employment size of SWHs is given in table-2.III

Table-2.III

Distribution of PC's and Servers Installed In SWHs by Employment Size during 2000-01

Employment Size	Software Houses	Computers (PC)	Computer Servers (PC)	Other servers (PC)	No. of Employees
	Nos.	Nos.	Nos.	Nos.	Nos.
Total	**278**	**9585**	**742**	**152**	**8527**
Upto10 persons	65	610	78	9	325
11-20 persons	72	1207	125	12	1080
21-30 persons	54	1677	152	19	1350
31-40 persons	33	1094	107	13	1155
41-50 persons	17	784	50	21	765
51-60 persons	8	448	40	15	440
61-70 persons	9	486	42	5	585
71-80 persons	3	340	21	2	225
81-90 persons	4	293	26	0	340
91-100 persons	3	360	20	6	285
100 and above persons	10	2286	81	50	1977

Source: Federal Bureau of Statistics, 2002.

The above table brings out the position regarding the number of SWHs by employment size, number of computers and servers. There were only 3 SWHs providing employment to workers between 91-100. 65 SWHs had a capacity of employing 10 workers at an average. Majority of SWHs were providing employment to 11-40 workers. Positive relationship was not found between the number of workers and computers in majority of the SWHs. This could be due to quality of devices, workload, market position; investment made as well as educationally qualified workers.

The distribution of SWHs in major cities of Pakistan in respect of Internet connectivity is contained in table below.

Table 2.IV

Distribution of Software Houses by Type of Internet Connectivity during 2000-01

Major Cities	Software Houses	Dial-Up	ISDN	Digital Cross Connection	Radio Modem	VSAT	Others
	Nos.	Nos.	Nos.	Nos.	Nos.	Nos.	Nos.
Pakistan	**278**	**238**	**39**	**33**	**9**	**6**	**11**
Islamabad	56	47	6	7	1	3	2
Rawalpindi	20	16	1	5	0	0	0
Lahore	80	66	20	6	4	0	4
Karachi	103	91	10	14	2	3	5
Other Cities	19	18	2	1	2	0	0

Source: Federal Bureau of Statistics, 2002.

There are various ways of communication, but the introduction of computer and Internet has provided a faster way of communication, which was not previously available. In Pakistan, SWHs are using Dial-Up, Integrated Services Digital Network (ISDN), Very Small Aperture Terminal (VSAT), Digital Cross Connection and Radio Modems for information and communication.

The most common Internet connectivity in Pakistan is dial-up, and dial-up networking, where individuals and multiple users can use one telephone line, for their information purposes. Second is the ISDN, which is used for digital transmission over ordinary copper wire as well as over other media. VSAT is a satellite communication system, which is reportedly gaining popularity among end users and the business class. The data showed the type of connectivity in SWHs. Majority of SWHs i.e. 86 percent had Dial-Up facility, 14 percent had ISDN, about 12 percent were with a Digital Cross Connections, 3 percent radio Modem and only 2 percent VSAT

connectivity. A cheaper technology is expected to become available to the SWHs due to progress being made at the international level.

Export Earnings of SWHs

Out of 278 SWHs, 115 were involved in export of software programmes. The details of foreign exchange earning of these SWHs in big cities are given below:

Table-2.V

Number of Software Houses by Major Cities and Export Earnings during 2000-01

(In'000' USD)

Major Cities	Software Houses Reported	July 2000-June 2001	July 2001-Sep 2001
Pakistan	**115***	**22.1**	**3.9**
Islamabad	29	3.7	0.6
Rawalpindi	9	1.1	0.3
Lahore	36	13.9	2.3
Karachi	33	3.4	0.7
Other Cities	8	0.1	0.0

Source: Federal Bureau of Statistics, 2002.

*Only 115 SWHs provided information on export earnings.

SWHs in Lahore generated the highest income i.e. USD. 13.9 million during July 2000-June 2001, which was 62.7 percent of the total reported software export of the country. SWHs in Islamabad generated only USD. 3.7 million, which was 16.8 percent, followed by the SWHs at Karachi, with an earning of USD. 3.4 million, or 15.3 percent of the total.

Distribution of employed workers by gender and position is provided in table 2.VIII. The excessive use and proliferation of different technological devices is very common in the developing and merging economies. Pakistan is also no exception to the proliferation of technological devices including ICT, which could be analyzed under the following factors:

a) The use of ICT in Pakistan stems from changing MIS needs of organizations reinforced by demonstration effect.

b) Complete empirical data on the proliferation of ICT in Pakistan is not available however, it is obvious that the existing use of ICT could be strengthened through proper awareness, information and education. Skill enhancement of existing users of ICT is also one of the key factors in proper and productive use of the existing technology.

c) Manufacturing of IT devices (PC's, printers, peripherals, etc) is practically non-existent. Presently, only assembly activity of imported components is being undertaken. Whether Pakistan has requisite skills and manpower to commence manufacturing of IT devices, has yet to be studied.

Employment in SWHs

Around 8,527 (100%) persons were employed in 278 SWHs, of which about 7671 (90%) were males and 856 females. 94% were full time employees and the remaining were working on part-time basis. On the average about 30 persons were employed in one SWH. City wise analysis indicates that -female employment was almost the same i.e. about 10 percent. Average employment per SWH was high in Islamabad as compared to other cities. The ratio of full time and part time employment was also the same among all the cities. Table below gives the detail break up of employment by cities.

Table –2.VI

Distribution of Manpower Employment in SWHs by Sex and Cities

Major Cities	SWHs	Total		
		Both Sex	Male	Female
Pakistan	**278**	**8527**	**7671**	**856**
Islamabad	56	2190	1975	215
Rawalpindi	20	527	466	61
Lahore	80	2594	2349	245
Karachi	103	2865	2570	295
Other Cities	19	351	311	40

Source: Bureau of Statistics, 2002

Employment by Occupation

Analysis of data by occupation indicates that about 36.4 percent were programmers and system analyst and about 21.0 percent were executives, project managers and team leaders. Among the managerial and executive manpower about 7 percent (121) were females. Similarly of the total employed programmer/system analysts 10 percent were female. About 25.3 percent of the total employed persons in SWHs were the supporting staff life marketing personnel, Administrative and Accounting personnel and other staff. Table below provides details of employed persons in software houses by sex and status of full or part time employment.

Table-2.VII

Distribution of Manpower Employed in Software Houses by Occupation and Gender. During 2000-01

Position	Both Genders			Male			Female		
	Total	**Full Time**	**Part Time**	**Total**	**Full Time**	**Part Time**	**Total**	**Full Time**	**Part Time**
	Nos.	**Nos.**	**Nos.**	**Nos.**	**Nos.**	**Nos.**	**Nos.**	**Nos.**	**Nos.**
Total	**8527**	**8022**	**505**	**7671**	**7236**	**435**	**856**	**786**	**70**
Executive	585	526	59	558	500	58	27	26	1
Project Manager	561	542	19	523	504	19	38	38	0
Team Leader	613	601	12	557	546	11	56	55	1
System Analyst	663	633	30	619	598	21	44	35	9
Programmer	2438	2281	157	2167	2037	130	271	244	27
Data Entry Personnel	964	864	100	835	742	93	129	122	7
Network & DB Administrator	376	353	23	366	344	22	10	9	1
Call Center Staff	174	147	27	133	117	16	41	30	11
Marketing Personnel	442	420	22	396	381	15	46	39	7
Admin. Personnel	647	623	24	538	518	20	109	105	4
Accounting Personnel	354	336	18	337	319	18	17	17	0
Others	710	696	14	642	630	12	68	66	2

Source: Federal Bureau of Statistics, 2002.

Out of the total employed work force of 8527 in 278 SWHs, 7671 were male workers and 856 female. Of the total male workers, highest number i.e. 2438 was working as programmer. Similarly, 271 females worked as programmers. There were 835 male and 129 female workers as data entry staff. There were 109 female working in the administration as against 538 male workers. This was the highest ratio of female workers in a department.

Employment by Sex and Education

Table-2-VIII

Distribution of Manpower Employed in SWHs by Sex and Education level during 2000-01

Qualification	Both Genders			Male			Female		
	Total	IT	Non-IT	Total	IT	Non-IT	Total	IT	Non-IT
	Nos.	Nos.	Nos.	Nos.	Nos.	Nos.	Nos.	Nos.	Nos.
Total	**8527**	**6447**	**2080**	**7671**	**5865**	**1806**	**856**	**582**	**274**
PhDs	85	61	24	83	60	23	2	1	1
M.Phil	44	20	24	42	18	24	2	2	0
Master's Degree	2597	2016	581	2337	1820	517	260	196	64
Bachelor's Degree	3619	2834	785	3224	2548	676	395	286	109
Intermediate	947	633	314	800	570	230	147	63	84
Diploma	645	537	108	609	508	101	36	29	7
Others	590	346	244	576	341	235	14	5	9

Source: Federal Bureau Of Statistics, 2002.

An analysis of data regarding employment of SWHs by level of education indicates that there were 85 PhDs (about 1.0 percent of the total employment in the software houses covered in the census). Among these PhDs, 61 (72%) were in IT and the remaining the 24 (28 %) Non-ITs worked in executive and managerial capacity. Sex-wise review of PhDs indicates that there were only two female PhDs, one being in IT. Similarly, there were 44 M.Phils, only half a percent of total employment and about half the number of PhDs. Two were females, both having degrees in

IT. Besides, there were 2597 Master Degree holders employed in SWHs (around 30 percent of total employment). Of the total Master's Degree holders, 78 percent had IT qualifications. Sex-wise analysis indicates that 10 percent of the total Masters Degree holders were female, and among these female 75 percent had IT backgrounds. Out of 3619 (42.4%) Bachelor's degree holders, 2834 (78%) were IT related Bachelors and the remaining 22 percent were Non-IT. About 25 percent of the employees had intermediate (American high school equivalent) or other diplomas.

The gender gap observed in the ICT discipline is reflective of the overall low participation rate of female in the labour market. This is not because of any conscious discrimination but it is simply due to lack of interest and involvement of women in ICT. Consequent upon the efforts of the government the participation rate of women is improving in the labour market and also in ICT discipline which is likely to reduce the gender gap in near future.

In terms of employment in the ICT sector, there is no tangible evidence of gender discrimination. The observed data is reflective of the overall low female participation rate in the labor market. Temporal statistical data would have to be gathered over several coming years to see how Governmental policies affect female participation in this segment.

Internet Services

Cyber Net, the first Internet Service Provider in Pakistan, was established in 1996 and can rightly be termed as the most proactive ISP in the country. Over the last eight years, several others like Brain Net, COMSATS, WOL Net, etc. have joined the fray. Today, 70 ISPs service an estimated 120,000 customers, providing them Internet connectivity and other web-related services.

COMSATS Internet Services took an initiative to train and transform the IT workforce of Pakistan in Cisco Network Training. CIS is the only indigenous Pakistani company that is 'Cisco

Learning Partner'. It has been offering Certified Cisco Training for over two years. COMSATS plans to conduct two Cisco Certified courses per month in Lahore, Karachi and Islamabad simultaneously. The plan is to produce over 800 IT professionals each year.

Public Data:

According to data garnered from the Board of Investment (**BOI**), ITT Division, PSEB, and similar other sources, the ICT industry in Pakistan is encapsulated in the following data:

A. IT Connectivity and Hardware:

Computer Ownership	600,000-800,000
Cities and Towns connected with internet	1898
Internet connections/subscribers	2.57 million (May, 2004)
Number of ISPs	127 (June, 2004)

B. Software / IT Services Industry:

Total Number of IT companies	900 (registered) 400 (active)
Foreign IT & Telecom companies	55
Software Industry turnover	$ 70-80 million (approx)
Of which export during 2003-04	$ 20 million
FDI during 2003-04	$ 104 million

C. Telecom Industry Statistics:

Investment	$ 4.2 billion (June, 2003)
Sales Turnover	$ 1.8 billion
Number of Cellular users (June 2004)	5 million (3 per 1000 pop)
Telephone Density (June 2004)	2.7 per 1000 pop
Fixed Phones:	
Installed	5.2 million (May, 2004)
Working	4.4 million

Chapter-3

Impact of ICT on Decent Work

Comparative Position

In order to assess the impact of information technology on decent work a questionnaire was developed and operated in the field to collect data on the intended variables relating to decent work during 2003-04. The respondents were currently doing IT jobs and had experience of previous jobs without IT. The respondents were selected on random basis from the following sectors in big cities and a few small localities.

1. Education Sector
2. NGO Sector
3. Hotels
4. Industry
5. Banks
6. Hospitals
7. Software Houses
8. Government Departments
9. Multi National Corporations (MNCs)

IT has been introduced in Pakistan recently i.e. from 1996 and that too, in major cities. Keeping in view, the proliferation of IT, a survey was conducted in the main cities such as Lahore, Islamabad and Rawalpindi along with few small localities. The data provided a comparative position of various parameters concerning present IT- job and previous Non- IT jobs of workers. The main findings of the survey, on the basis of information collected, are shown in the following tables.

I. Employment Status

The data given in table 3-I indicates the employment situation of workers at IT and non- IT Jobs.

Table 3-I

Percentage Distribution of Employees with present and previous employment status by Sectors.

Sectors	Workers	Present Job with IT Skill		Previous Job without IT Skills	
		Employed	* Unemployed	Employed	* Unemployed
Education	100	93.7	6.2	81.2	18.7
NGOs	100	91.0	9.0	91.0	9.0
Hotels	100	94.0	6.0	100	0
Industry	100	100	0	92.6	7.4
Banks	100	93.0	7.0	93.0	7.0
Hospitals	100	100	0	100	0
Software Houses	100	100	0	83.8	16.1
Government Departments	100	100	0	89.2	10.8
MNCs	100	100	0	100	0
Average	**100**	**96.8**	**3.1**	**92.3**	**7.6**

* Who remained unemployed for more then 12 months.

The above table brings out the fact that with attainment of IT skills the percentage of unemployment decreased in all the sectors except in NGOs, whereas in hospitals, banks and MNCs, the percentage remained the same. In hotel sector 6 percent employees remained unemployed even after acquiring IT skills. The over all data indicates that 3.1 percent of the respondents with IT skills remained unemployed as compared to 7.6 percent employees without IT skills. The employees who were found employed after having IT skills was 96.8 percent as compared to 92.3 percent in non- IT jobs. **This shows a positive relationship between job opportunity and IT skills.**

II. Fair Treatment

Fair treatment refers to situation where the rights of workers are realized on equality basis pertaining to salary, allowances, organizational behavior, working environment, working hours, medical facilities, leave etc. The data given in table 3-II indicates the position of employees getting fair treatment at present IT job and previous non IT job.

Table-3-II

Percentage Distribution of Employees with present and previous job regarding Fair Treatme nt by Sectors.

Sectors	Workers	Present with IT Skill		Workers	Previous Job without IT Skill	
		Fair	Poor		Fair	Poor
Education	100	100	0	100	87.5	12.5
NGOs	100	100	0	100	82.0	18.1
Hotels	100	94.0	6	100	87.5	12.5
Industry	100	96.0	4	100	70.0	30.0
Banks	100	100	0	100	78.0	22.0
Hospitals	100	100	0	100	67.0	33.0
Software Houses	100	100	0	100	100	0
Government Departments	100	93.4	6.5	100	91.0	9.0
MNCs	100	100	0	100	100	0
Average	**100**	**98.0**	**2.0**	**100**	**85.0**	**15.0**

The above table shows comparative data concerning fair treatment of employees at new IT and previous non-IT jobs. **The data indicated a positive improvement in fair treatment to employees while performing IT jobs in all the sectors except the MNCs**. The percentage of workers having fair treatment was 98.0 percent at IT jobs as compared to 85.0 percent at non-IT previous jobs. On the other hand, the percentage of employees receiving poor treatment was found as 15.0 percent at non-IT as compare to 2.0 percent at IT jobs. It is evident from the data that fair treatment status among the employees after acquiring IT skills improved in all the

sectors. It establishes a direct correlation between skill and respect of peers and bosses. The MNC's data being neutral implies that they have the luxury of cherry-picking in the market.

III. Balancing Family Life With Work

Balancing family life with work means to meet the family members' requirements pertaining to shelter, nutrition, education, health, recreation, etc. The data given in table 3-III indicates the position of employees pertaining to balancing family life with work at IT and non-IT jobs.

Table 3-III

Percentage Distribution of Employees with present and previous job and balancing family life with work by Sectors.

Sectors	Workers	Present Job with IT Skill		Workers	Previous Job without IT Skill	
		Yes	No		Yes	No
Education	100	50.0	50.0	100	75.0	25.0
NGOs	100	90.1	9.0	100	63.6	36.4
Hotels	100	75.0	25.0	100	75.0	25.0
Industry	100	96.2	3.7	100	74.0	26.0
Banks	100	73.3	26.6	100	60.0	40.0
Hospitals	100	66.6	33.3	100	66.6	33.3
Software Houses	100	83.3	16.6	100	83.3	16.6
Government Departments	100	84.7	15.2	100	73.9	26.1
MNCs	100	75.0	25.0	100	75.0	25.0
Average	**100**	**77.0**	**23.0**	**100**	**72.0**	**28.0**

The data indicated that the IT job holders had more resources to balance their family affairs as compared to non-IT workers. This pattern was prevalent in NGOs, industry, banks and in Government departments. On the other hand, the percentage remained the same in hotels, hospitals, software houses and MNCs. Only in the education sector the percentage of employees

not balancing family life with work was found higher as 50.0 percent in IT jobs as compared to 25.0 percent in non-IT jobs.

The overall data indicated that 77.0 percent employees in present IT jobs were giving proper time to their families as compared to 72.0 percent in non- IT jobs. Whereas, the percentage of employees who were not taking care of their families was 28.0 percent at non-IT job as compared to 23.0 percent at IT jobs. **The analysis shows that relatively higher ratio of employees are balancing their family life, while working in IT jobs as compared to non-IT jobs because they were financially empowered to do so.**

IV. Over Time Work

The data given in the table 3-IV indicates the over time work carried out by employees at IT and non-IT jobs.

Table3-IV

Percentage distribution of Employees Regarding Over Time work by Sectors

Sectors	Workers	Present Job with IT Skill			Workers	Previous Job without IT Skill		
		Over Time				Over Time		
		Yes	No			Yes	No	No Opinion
Education	100	68.7	31.2	-	100	18.7	75.0	6.2
NGOs	100	18.1	81.8	-	100	9.0	72.7	18.1
Hotels	100	37.5	62.5	-	100	12.5	81.2	6.2
Industry	100	40.7	59.2	-	100	37.0	44.4	18.5
Banks	100	56.6	43.3	-	100	30.0	46.6	23.3
Hospitals	100	50.0	50.0	-	100	33.3	33.3	33.3
Software Houses	100	33.3	66.6	-	100	16.6	83.3	-
Government Departments	100	23.9	76.0	-	100	26.0	65.2	8.6
MNCs	100	75.0	25.0	-	100	50.0	50.0	0
Average	**100**	**45**	**55**	**-**	**100**	**26**	**61**	**13**

The data showed that a higher percentage of employees at IT jobs found opportunities to do overtime work. In all sectors except the government sector, the percentage of employees with IT skill doing over time work was more as compared to non-IT jobs. The data indicated that employees doing overtime work were 45.0 percent at IT jobs as compared to 26.0 percent at non-IT jobs**. It showed that the additional work opportunities were available for IT workers as compared to non-IT workers**. The IT workers were able to augment their household income because of additional work

V. Job Market

The data given in table 3-V shows the present job market situation assessed by workers at IT jobs.

Table-3-V

Perception of employees Regarding Job Market Pertaining to Low IT Skills during 2003-04

Sectors	Workers	Positive	Negative
Education	100	12.5	87.5
NGOs	100	54.5	45.4
Hotels	100	25.0	75.0
Industry	100	44.4	55.5
Banks	100	26.6	73.3
Hospitals	100	50.0	50.0
Software houses	100	16.6	83.3
Government departments	100	39.1	60.8
MNCs	100	75.0	25.0
Average	**100**	**38.0**	**62.0**

The data indicated the opinion of the employees about the job potentials for low IT skilled personnel. On an average, 38.0 percent employees were hopeful about the job market of low IT skilled workers, but 62.0 percent showed their disappointment regarding the job market situation of low IT skills currently prevailing in the country. **A high percentage of respondents stated that fewer job opportunities were available for low skilled IT personnel as compared to highly skilled workers.**

Some of the interviewers responses are reproduced below:-

Positive Opinion about Job Market

1. Job opportunities are available for highly skilled IT personnel.

2. Computerization process is favoring job openings.
3. Female IT skilled labour is being preferred in the market.
4. Experienced people are always preferred.

Negative Opinion about Job Market

1. Over production of IT skilled labour.
2. Low quality of IT education.
3. Irrational and excessive bias towards IT education.
4. Low salaries in IT jobs.
5. Preparing IT personnel without focusing on absorption capacity.
6. Higher education is expensive.
7. IT labour use short cuts in their work.

The analysis showed that the job market for the IT skilled labour in Pakistan was not in line with rising number of low IT skilled workers.

VI. Capacity Enhancement

Table 3-VI indicates the position of employees with capacity enhancement opportunities at present IT and previous non-IT jobs.

Table-3-VI

Percentage Distribution of Employees with present and previous job and opportunities of Capacity Enhancement by Sectors.

Sectors	Workers	Present Job with IT Skill		Workers	Previous Job without IT Skill		
		Enhanced	Not Enhanced		Enhanced	Not Enhanced	No Opinion
Education	100	62.5	37.5	100	37.5	62.5	6.2
NGOs	100	90.9	9.0	100	54.5	27.2	18.1
Hotels	100	43.7	56.2	100	31.2	62.5	6.2
Industry	100	75.0	25.0	100	22.2	62.9	18.5
Banks	100	100	0	100	40.0	36.6	23.3
Hospitals	100	66.6	33.3	100	33.3	33.3	33.3
Software Houses	100	50.0	50.0	100	16.6	83.3	0
Government Departments	100	63.0	36.9	100	26.0	65.2	8.6
MNCs	100	100	0	100	25.0	75.0	0
Average	**100**	**72.0**	**28.0**	**100**	**32.0**	**56.0**	**12.0**

The above table indicates the capacity enhancement opportunities being provided to the employees at both the job situations. **It was found that capacity enhancement opportunities prevailed significantly in the IT jobs, as 72.0 percent employees reported having capacity enhancement opportunities as compared to 32.0 percent while they worked at non-IT jobs**. This may be due to the fact that the capacity building of the IT employee was essential to keep pace with the newly emerging technological advancement as well as the labour market requirements and competition.

On the contrary, higher percentage of employees, i.e. 56.0 percent was found having no opportunities of capacity enhancement while employed in non-IT jobs. Only 28.0 percent

employees in the IT jobs reported that they are not being provided any facility to enhance their skills.

VII. Level of Satisfaction

Table 3-VII indicates the position of workers with their level of satisfaction at present IT and previous non- IT jobs.

Table-3-VII

Percentage Distribution of Employees with present and previous job and Level of Satisfaction by Sectors.

Sectors	Workers	Present Job with IT Skill			Workers	Previous Job without IT Skill		
		Satisfied	Not Satisfied			Satisfied	Not Satisfied	No Opinion
Education	100	100	0	-	100	75.0	18.7	6.2
NGOs	100	82.0	18.0	-	100	82.0	0	18.1
Hotels	100	100	0	-	100	87.5	6.2	6.2
Industry	100	89.0	11.0	-	100	63.0	18.5	18.5
Banks	100	90.0	10.0	-	100	57.0	20.0	23.0
Hospitals	100	84.0	16.0	-	100	67.0	0	33.0
Software Houses	100	84.0	16.0	--	100	84.0	16.0	0
Government Departments	100	89.0	11.0	-	100	65.0	26.0	9.0
MNCs	100	100	0	-	100	75.0	25.0	0
Average	**100**	**91.0**	**9.0**	**-**	**100**	**72.8**	**14.5**	**12.6**

An improvement in the satisfaction level of IT employees was found due to various factors such as working environment, clean job, income etc. The situation of the workers in all the sectors improved greatly except those working in NGO and Software Houses. On the other side, the ratio of employees not satisfied while working at non-IT jobs was 14.5 percent as compared to 9.0 percent workers in IT jobs. **The over all data indicated that 72.8 percent non-IT**

employees were satisfied with their jobs as compared to 91.0 percent employees in the IT related jobs. The data, however, indicated a positive influence on the satisfaction level of employees who were holding IT jobs as compared to non-IT jobs.

VIII. Job Security

Job security situation of workers at IT and non-IT Jobs is shown in table 3-VIII.

Table-3-VIII

Percentage Distribution of Employees with present and previous Job Security by Sectors.

Sectors	Workers	Present Job with IT Skill		Workers	Previous Job without IT Skill		
		Yes	No		Yes	No	No Opinion
Education	100	75.0	25.0	100	56.2	37.5	6.2
NGOs	100	90.9	9.1	100	81.8	0	18.1
Hotels	100	68.7	31.2	100	56.2	37.5	6.2
Industry	100	85.0	14.8	100	66.6	14.8	18.5
Banks	100	86.6	13.3	100	50.0	26.6	23.3
Hospitals	100	83.3	16.6	100	50.0	16.6	33.3
Software Houses	100	83.3	16.6	100	83.6	16.6	0
Government Departments	100	87.0	13.0	100	60.8	30.4	8.6
MNCs	100	100	0	100	50.0	50	0
Average	**100**	**85.0**	**15.0**	**100**	**61.7**	**25.5**	**12.7**

According to data, 85.0 percent employees in the IT utilizing organizations reported that they were satisfied with their jobs as against 61.7 percent of employees while working in non- IT organizations. **Employees who did not have a feeling of job security constituted 25.5 percent at non-IT as compared to 15.0 percent at IT jobs**. The employees who were at their first job and did not respond about their experience of non-IT jobs were 12.7 percent. It was found that the higher number of employees was satisfied while working on IT jobs.

IX. Living Standard of IT Workers

The data given in table 3.IX provides information about the impact on the living standard of IT workers.

Table-3-IX

Percentage Distribution Of Employees with IT skill and Improvement In Living Standard by Sectors.

Sectors	Workers	Improved	Not improved
Education	100	81.2	18.7
NGOs	100	81.8	18.1
Hotels	100	87.5	12.5
Industry	100	66.6	33.3
Banks	100	70.0	30.0
Hospitals	100	100	0
Software houses	100	83.3	16.6
Government Departments	100	65.2	34.7
MNCs	100	100	0
Average	**100**	**82.0**	**18.0**

The above data indicated that living standards of 82.0 percent employees improved in IT jobs, mainly due to increased income level. It may be acknowledged that the IT has brought a positive change in the living standards of the employees. Of the total 18.0 percent workers responded that IT related job could not improve their living standards due to inflationary pressure as the salary structure was not in accordance with the inflation rate.

There has been long debate on automation vs. manual work in the developing countries including Pakistan. It is evident that with the introduction of automation at work places the manual workers have to loose their jobs, because one machine can replace a good number of workers. ICT has created jobs for highly skilled IT persons on the one hand and reduced jobs for low skilled on the

other. The use of ICT has created new jobs in some of the sectors. For example, computers related use in designing, graphics; art and printing have displaced a number of workers. This is evident of this fact that the use of ICT has created as well as reduced jobs equally in various sectors of the economy.

Almost all new technologies have some in built problems and difficulties are encountered while they are being adopted. Similarly, the introduction of ICT has confronted workers with the task of dealing with changed tools and apparatuses. To name a few of the hurdles:

- Inadequate IT infra structure
- Inadequate provision of IT instruments.
- Lack of IT connectivity in remote areas.
- Low skill amongst IT workers.
- Poor adaptability and adjustment towards IT, both by management and workers.
- Financial constraints of IT users

This existing state of affairs of IT proliferation, inter-alia, demonstrates lack of planning and balances between demand and supply of labour force at the macro level. In the wake of IT introduction a large number of private institutions have been established in the country producing a fair volume of lower level IT manpower, whereas the job market is not expanding sufficiently to cater for them. A number of training institutions are awarding certificates and degrees without ensuring that the quality of education matches business requirements.

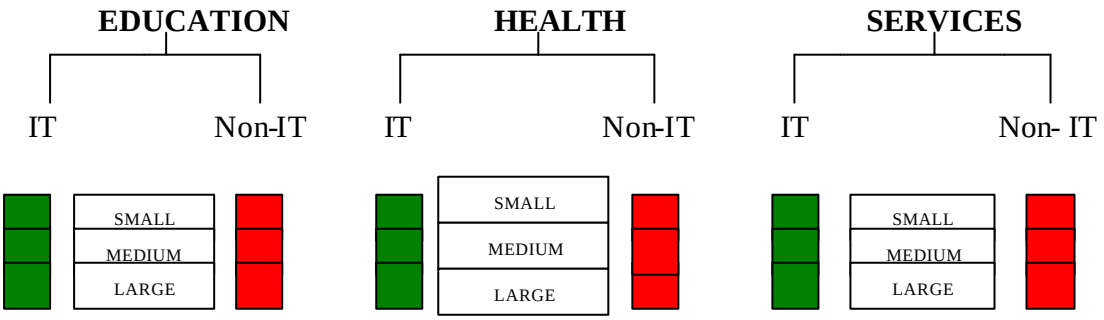
Chapter -4

Case Studies

For the purpose of case studies three different types of organizations utilizing and not utilizing IT were selected. Within these organizations, small, medium and large units were selected. The information was collected during 2003-04 from the management of each unit. The details are provided below:

a. Education. **b. Health** **c. Services.**

Each of these sectors was sub divided into small, medium and large units on the basis of human resource allocation. In each of the units, six organizations, three each utilizing and not utilizing IT were selected.



A qualitative questionnaire was used to assess the impact of IT. The questionnaires were filled in at managerial level in each organization to collect information about the impact of IT on different variables. Similarly, non-IT organizations were also contacted to obtain their views in case the organization starts using IT devices. The tables below describe the sector-wise and unit-wise impact of ICT.

9 December 2004

I. CASE STUDY OF EDUCATION SECTOR

Table-4-I

Comparative Statement of Executive Heads of Small, Medium and Large Units, one year after adopting IT

Units	H.R Allocation Decreased		Female Representation Increased		Productivity Increased		Marketing Improved		Training Improved		Cost Reduced	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Small	1	-	1	-	1	-	-	1	1	-	1	-
Medium	1	-	1	-	1	-	1	-	-	1	1	-
Large	1	-	1	-	1	-	1	-	1	-	1	-
Total	3	0	3	-	3	0	2	1	2	1	3	0
%age	100	0	100	0	100	0	67	33	67	33	100	0

Comparative Statement of Executive Heads of Small, Medium and Large Units Not using IT during the last one year

Units	HR Allocation Decreased		Female Representation Increased		Productivity Increased		Marketing Improved		Training Improved		Cost Reduced	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Small	-	1	-	1	1	-	1	-	1	-	1	-
Medium	-	1	-	1	-	1	-	1	-	1		1
Large	-	1	-	1	-	1	-	1	-	1		1
Total	0	3	0	3	1	2	1	2	1	2	1	2
%age	0	100	0	100	33	67	33	67	33	67	33	67

NOTE: the management of all the sectors and units was reluctant to provide information on key parameters like budget, expenditure, investment etc.

The data regarding three units of the education sector indicated that productivity improved and cost reduced in all scale of organizations after adopting IT. The medium and large organizations were taking full advantage of marketing the products/services through IT utilization. The table also shows that the organizations in small and large units were providing in house training for skill enhancement of its employees.

The data about the non-IT organization indicated that only in the small units productivity had been found increasing. These units were also satisfied with their current non-IT marketing strategies and providing training to their employees. These units further indicated that their cost per unit is already reduced without using IT devices**.** The negative reply of the medium and large units not using IT was recorded concerning productivity, training, marketing and cost reduction.

It is evident of the fact that IT has improved almost all the parameters as well as increased human resource allocation and representation of female work force in IT using organizations vs. non-IT entities.

9 December 2004

II. CASE STUDY OF HEALTH SECTOR

Table-4-II

Comparative Statement of Executive Heads of Small, Medium and Large Units, one year after adopting IT

Units	HR Allocation Decreased		Female Representation Increased		Productivity Increased		Marketing Improved		Training Improved		Cost Reduced	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Small	1	-	1	-	1			1	1			1
Medium	1	-	1	-	1		1		1		1	
Large	1	-	1	-	1		1		1		1	
Total	3	0	3	0	3	0	2	1	3	0	2	1
%age	100	0	100	0	100	0	67	33	100	0	67	33

Comparative Statement of Executive Heads of Small, Medium and Large Units Not using IT during the last one year

Units	HR Allocation Decreased		Female Representation Increased		Productivity Increased		Marketing Improved		Training Improved		Cost Reduced	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Small	-	1	-	1	1			1	-	1		1
Medium	-	1	-	1		1	1		1		1	
Large	-	1	1	-		1		1		1		1
Total	0	3	1	2	1	2	1	2		1	1	2
%age	0	100	33	67	33	67	33	67	33	67	33	67

The above data shows that the productivity and capacity building opportunities improved in all scales of organizations after adoption of IT. The workers at IT utilizing organizations were availing the opportunity of training because of the availability of IT devices in the respective organizations. The date also indicates that the female labour force was found comparatively higher in IT adopted organization as compared to non-IT utilizing organizations.

The organizations not utilizing IT during the period of one year i.e. 2003-04, did not register any improvement in productivity, market and capacity building of their employees.

The data reveals that with the adoption of IT devices the human resource allocation in IT utilizing organizations was decreased, whereas, IT contributed towards higher female participation in the labour market. Whereas, the situation in the non-IT utilizing organizations is opposite in terms of human resource allocation. Only the large units in non-IT utilizing organization shows that the female participation has increased, whereas, the female participation in medium and small sector shows no improvement.

. III. CASE STUDY OF SERVICES SECTOR

Table-4-III

Units	HR Allocation Decreased		Female Representation Increased		Productivity Increased		Marketing Improved		Training Improved		Cost Reduced	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Small	1	-	1	-	1	-	1	-	1	-	1	-
Medium	1	-	1	-	1	-	1	-	-	1	1	-
Large	1	-	1	-	1	-	1	-	1	-	1	-
Total	3	0	3	0	3	0	3	0	2	1	3	0
Percentage	100	0	100	0	100	0	100	0	67	33	100	0

Comparative Statement of Executive Heads of Small, Medium and Large Units, one year after adopting IT

Comparative Statement of Executive Heads of Small, Medium and Large Units not using IT during the last one year

Units	HR Allocation Decreased		Female Representation Increased		Productivity Increased		Marketing Improved		Training Improved		Cost Reduced	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Small	1	-	-	1	-	1	1	-	1	-	1	-
Medium	-	1	-	1	1	-	-	1	-	1	-	1
Large	1	-	-	1	1	-	-	1	1	-	-	1
Total	2	1	0	3	2	1	1	2	2	1	1	2
Percentage	67	33	0	100	67	33	33	67	67	33	33	67

The above data indicated that IT had influenced positively, the IT utilizing organizations in terms of increasing productivity, marketing and reducing per unit cost. The small and large units responded positively about capacity building whereas, the medium units were not providing training courses even after the adoption of IT.

The data reveals that 67 percent of the organizations in non-IT organization responded positively in terms of productivity and training. A number of workers were having training facilities in small and large units of non-IT organizations. It was also brought out that per unit cost reduction was not observed in the medium and large units of non-IT organizations, whereas, the cost reduction was observed in all scales of organizations who have adopted IT. The female participation improvement was also ascribed to IT.

The above data indicates that due to application of IT devices the human resource allocation was reduced in IT organizations. All three scales of units indicated that the representation of female work force was increased because of IT adoption. In the non-IT organizations only medium unit indicated that the allocation of human resources was increased, whereas, the female representation had not shown any improvement in all the units.

Chapter-5

Conclusion and Recommendations

Realizing the importance of Information and Communication Technology, Pakistan started the process of IT to meet the challenges of globalization era. Accordingly, in 1997 the Federal Government set up an independent Division of Information Technology and Tele Communication, which supervise the working of eight departments involved in ICT matters including Pakistan Computer Bureau, Electronic Government Directorate, and Pakistan Software Export Board.

Unfortunately, due to paucity of resources or allocation of a lower priority to IT as compared to other sectors of the economy, the Government of Pakistan is constrained to follow a non-optimal strategy for enhancement in the IT sector. In the private sector, however, a large number of SWHs have been established all over the country with concentration in main cities. These SWHs were earning a reasonable amount of foreign exchange until the post-9/11 recession in software development.

In the wake of IT introduction, a large number of private training institutions have been established in the country which are producing a large number of low IT skilled manpower. The government of Pakistan needs to take immediate measures to check this mushroom increase of low skilled work force.

There is a kind of structural unemployment of IT professionals. The job market for IT personnel is not keeping pace with the ever-growing number of ICT professional. Thus there is a mismatch between the demand and supply of IT personnel at various skill levels. It resulted in severe shortages of highly skilled personnel as well as the surpluses at the lower skill level.

The results of a sample survey carried out by Pakistan Manpower Institute, revealed a positive correlation between IT and decent work. The introduction of IT in the country has led to varying degree of improvement in job security, living standards, fair treatment to employees, level of workers' satisfaction, capability enhancement, balancing family life with work etc. The results of present survey are based on small number of samples drawn from individual and firm levels. In order to fully comprehend the entire scenario of ICT-decent work relationship, a research on a larger canvass need to be undertaken both in the private and public sector of Pakistan. Detailed studies are required to be carried out in order to determine how best ICT can be applied in the special context of a developing country like Pakistan, where its role has yet to assume fuller proportions and substance. One hopes that Pakistan Software Export Board's (PSEB) much trumpeted study in this regard will soon bear the desired fruit.

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