Chapter 18

Information Technology

Introduction

Information technology (IT), a knowledge-based industry, with the potential to become an engine of accelerated economic growth, productivity improvement, provide efficient means of governance, holds large employment potential, provides new opportunities to tackle problems related to rural poverty, health, illiteracy and environmental degradation. The Government of India has been emphasising from time to time the role of information technology in the development process.

During the Eighth Plan period, i.e., 1992-97, there was hardly any activity in the IT sector in Himachal Pradesh. Recognising the role of IT in socio-economic development, Himachal Pradesh, engaged NASSCOM (National Association of Software and Service Companies), a premier national body, to suggest a plan for developing the IT industry in the state.

NASSCOM submitted its report, *Himachal Pradesh: Millennium IT Vision 2010*, exhorting the state to create a state-of-the-art world class IT infrastructure, develop high quality human resource and redefined role for the government in the new digital setup. Beside the IT Vision 2010 for Himachal Pradesh, the NASSCOM report has recommended an IT action plan for human resource development, developing IT infrastructure and implementing e-governance.

According to the NASSCOM, the IT industry in Himachal Pradesh can grow at a highly accelerated pace to achieve an annual turnover of Rs. 20,000 crore (US$ 4.7 billion) by the year 2009-10, which is four to five per cent of the projected turnover of US$ 100 billion for the same year by the Indian IT software and service industry, subject to the implementation of the recommendations of the NASSCOM by the state.

Information Technology Policy – 2001

The state announced *Information Technology Policy – 2001,* spelling out Himachal Pradesh as an attractive IT destination after different industry associations, academia and government departments were consulted and deliberated upon for their views on the IT policy. Most of the recommendations made by NASSCOM were accepted. The state has embarked upon a plan for using IT in the overall development process by involving masses at all levels.

Himachal Pradesh has a number of positive indicators for the growth and development of IT industry. It has good climatic conditions with dust free and cool environment, good telecom infrastructure, adequate power supply, road network, hospitality industry and relatively low cost of living. However, the state has some specific constraints, which needs immediate attention for the growth of IT industry. These are:

- Development of high-grade human resource suitable for IT industry
- Availability of high-tech infrastructure suitable for IT industry
- Insufficient allocation of funds to IT
- Inadequate transport facilities including international airports

In the last three years, the state government has taken some positive steps and declared IT savvy policies but it has not resulted in any perceptible growth in IT software and service industry in the state. As compared to some of the other leading states in India, such as Karnataka, Andhra Pradesh, Maharashtra, Tamil Nadu, Delhi and Haryana, the growth of IT software and service industry in the state has been negligible.

IT Human Resource Development

Human resource development is the single most important factor in the IT industry and has played a key role in developing India as a software hub. Himachal Pradesh has to undertake effective measures to produce quality IT human resource.

The IT industry can be divided into three categories: 'A' - Software Product and Technology Services; 'B' - IT Services; and 'C' - IT Enabled Services (ITES). For categories 'A' and 'B', the qualifications required are MS/M.Tech/B.Tech in Computer Science, MCA or B.Tech from the non-computer stream with training of one to two years in specialised IT technologies. For category 'C', the qualifications required are BA/B.Sc/ B.Com/MA/M.Sc/Diploma/ITIs with a specialised six months training in ITES.

Categories 'A' and 'B': NASSCOM has projected a turnover of Rs. 12,500 crore by 2009-10 for these two categories. Based on the Ministry of Information Technology (MIT) Report, for achieving this turnover, it could be estimated that 38,000 IT engineers would be required to achieve this target.

Out of 660 degree holders, (see the table below) at the most, only one-third would be available for the IT industry. These could be direct IT graduates and those from other engineering fields opting for the IT industry after getting necessary IT specialised training.

Level of the Programme	Institution		Intake		No. of Courses
	Govt.	Self Financing	Govt.	Self Financing	
Degree	1	2	240	420	7
Diploma	7	—	820	—	11
Certificate Course	54	5	2839	276	36

Source: *Technical Education Quality Improvement Programme of GoI, Himachal Pradesh State Report for Appraisal Mission, June 2002,* Department of Technical Education, H.P.

Presently, the state has one Regional Engineering College at Hamirpur and two private engineering colleges at Kala Amb and Baddi. The Jaypee Institute of Information Technology has come up in the private sector in Solan District. Taking into consideration the existing capacity, assuming a growth of 20 per cent new seats in the existing engineering colleges every year, new graduates from the Jaypee Institute of Information Technology, and the possibility of setting up at least one new engineering institute in the state every year, the total number of IT engineers graduating in Himachal Pradesh would be about 10,000 by 2009-10 against the requirement of 38,000 as per the NASSCOM projections. The growth in this segment of the IT industry is slow as it has a longer gestation period.

For achieving a target of 10,000 IT engineers in categories 'A' and B' by 2009-10, the state has to play a very proactive role in promoting and brand building the IT industry in the state. Such companies as Infosys, Wipro, HCL, TCS and multinationals must be encouraged to set up their development centres in the state. The training of faculty should be ensured to meet the required standards, through their interaction and exchange with institutes of higher learning in India and abroad.

As also recommended by NASSCOM in their Vision 2010 report, the state must set up an IIIT for creating a high quality education hub. This will have far reaching multifarious effects on the state's higher education system. A beginning has been made in the private sector by setting up the Jaypee Institute of Information Technology.

Category 'C': ITES

IT Enabled services, such as Medical Transcription, Call Centres, Data Processing, Back-Office operations, GIS, Revenue Accounting are a niche area. It has emerged as a key engine of growth for the Indian IT industry and the technology-led services industry. Exports of ITES have increased to Rs. 11,300 crore in 2002-03 from Rs. 7,300 crore in the previous year, registering a growth of 59 per cent and is expected to grow 54 per cent during 2003-04. ITES exports from India have been projected to reach Rs, 72,900 crore by 2008.

The employment potential in ITES is large and the gestation period is less as compared to the other categories of the IT industry. The success of ITES will mainly depend on the quality of manpower and infrastructure. Knowledge-based skill-oriented training is the key to the quality of manpower. ITES, to succeed, requires top-class infrastructure with adequate bandwidth, fault-free and continuous power with two layers of redundancy to avoid any breakdown. Segment-wise skill sets required for different services under the ITES industry is as follows:

ITES: Skill Sets Required for Different Services

Segment	Skill Set Required
Customer services	Language, accent
Data processing	Computer literate
Human resource	HR skills, legal
Remote education	Domain knowledge
Engineering design	Domain knowledge
Translation & localisation	Language
Medical transcription	Computer literate, medical knowledge
Animation	Creative, computer literate
Finance	International/country-specific accounting
Web hosting	Computer literate
Market research	Knowledge of MR, statistics
Network consulting	Computers, LAN

Source: Mahindras Reality and Infrastructure Developers Ltd. Feasibility Report by Cushman & Wakefield, March 2000.

The NASSCOM report has projected a turnover of Rs. 7500 crore by 2009-10 for this category in Himachal Pradesh. This would require 92,000 ITES trained manpower. Presently, Himachal Pradesh enrols about 30,000 graduate students annually. Even if one-third of them are given special ITES-related training in their final year, the maximum number of students available would be 5000 taking into consideration the average pass ratio of 50 per cent. Further assuming an annual increase of 20 per cent, the total number available would be 36,000 by 2009-10.

For achieving this target, the development strategy would be to train the trainers; 500 teachers from the existing Arts/Science graduate colleges have to be trained by 25 ITES-expert trainers for a period of six months. These 500 teachers, after successful training would be the resource persons for training the graduates starting from 2004-05 onwards. Private institutions should also be encouraged to prepare the students for the ITES industry.

The state government has taken an initiative in this direction by introducing IT and computer education form classes IX to XII in 536 senior secondary schools in the state through a tie-up with ECIL, Hyderabad; MIAECT, Mumbai; and DOEACC, Shimla.

However, the state must ensure the quality of manpower in close association with the needs of the industry. It is strongly recommended that a **State Council of IT Education,** an autonomous body of experts, must be set up for looking after the quality and standardisation in both government and private sector institutes. This body should have all the necessary legal powers to check the unwanted mushrooming of private education institutions.

The state needs to take very effective measures to meet the target of 46000 IT manpower for the IT industry (for all categories) by 2009-10. The projected targets for the IT industry in the state need to be reduced from the NASSCOM projection of Rs. 20,000 crore to Rs. 7000 crore, which may be achievable if the state is decisively proactive**.**

E-Governance

E-governance is a must for efficient and effective government, facilitates more accessible government services, allow greater public access to information and make government more accountable to citizens. It is customer-driven and service oriented tool. It involves activities at three levels i) Office automation and Computerised Transactions Processing/Information Systems in various departments and Training, ii) Web Sites/Applications of the State Government/Departments/ Corporations/Boards on Internet and iii) Citizen-Government Interface. For implementing e-governance the major components of core infrastructure are statewide intranets, state data centres and service delivery infrastructure at state, district, block and village level.

E-governance is a process that requires sustained political will, resources and interaction among the government, private and public sectors. The suggested road-map and work plan for the implementation of e-governance in the state is as follows:

Road-Map

   i) Clear vision

  ii) State specific needs and priorities

 iii) Political and administrative will

 iv) Identification of nodal agency

  v) Promoting governmental and non-governmental stakeholders

 vi) Optimal selection of priority projects

 vii) Planning, implementation and monitoring

viii) Ensuring long term self-sustainability

Work-Plan

 i) Content development

    • Development of applications

- Open standards

- Local language interface

- User guides

- e-learning materials

 ii) Competency building

- Human resource and training programmes at all levels

iii) Connectivity

- Local networks and Internet connections

iv) Cyber laws

- Legal framework

v) Citizen interfaces

- Appropriate delivery channels

vi) Capital

- Identification of revenue streams like user charges, subscription or

- budgets

In Himachal Pradesh, the National Informatics Centre (NIC) has played a key role in implementing computerisation and e-governance projects. The satellite-based computer communication network (NICNET) of NIC connects all districts and the state headquarters with each other and with all such locations in the country. It facilitates services such as Internet, interactive communication, data transfers, e-mail and other value-added network services available on the NICNET to the state. The whole network has been provided with KU-band VSAT for higher speed connectivity to NICNET and Internet and facilitates high-speed data communication.

The use of IT or PC penetration and availability of I-net nodes is low in Himachal Pradesh. Effective implementation of e-governance will take IT to the common man, particularly the poor and those located in remote areas, spread IT culture and improve PC penetration.

The state government is also actively implementing HP State Wide Area Network (HPSWAN) connecting districts with the state headquarter. It should be extended to the block level and subsequently at the village level so that the benefit of IT percolates to the masses at large.

The state has also launched the official website of the Himachal Pradesh Government providing detailed information relating to various aspects of the state and the various Departments/Corporation/Boards of the state. However, it must be ensured that the websites are regularly maintained and updated with the latest data and information.

The state government has shown keen interest in implementing web-enabled interface of the government in providing clean, efficient, responsive and transparent administration. The **Lokmitra Project** has been a success. The project has been implemented on a pilot basis in Hamirpur district with district-wide Intranet having 25 Citizen Information booths located in the rural areas of the district with the active involvement of NIC, HP State unit with a loan of Rs. 40 lakh from NABARD. The population of 175 *panchayats* out of 225 has benefited from these 25 centres, which have also given employment to 25 educated unemployed youth in running these centres. The project has resulted in various direct/indirect social as well as economic benefits/deliveries to the rural masses like rural services such as land records, acquisition of land and registration of deeds, social services such as family pension, old age pension, registration of licences, ration cards, birth and death certificates etc.

It is essential that the Lokmitra project is expanded to all the other districts, thereby increasing employment generation and also facilitating the growth of ISPs throughout the state. To implement this project in other districts, the state is finding it difficult to fund the project from its own sources. Therefore, a financial support/grant-in-aid from Government of India is essential. A one-time grant-in-aid of a minimum of Rs. 50 lakh per district will go a long way in implementing this project in other districts. The state has to ensure project's long-term viability and sustainability. Selective private sector financial participation can go a long way for much needed funding.

According to the recommendations of the Working Group on IT for Masses, set up by the Government of India, five per cent of the state's total budget should be allocated for IT induction. Himachal Pradesh has already set up Department of Information Technology (DoIT). It is proposed that it should be further strengthened in terms of expertise and funds. It is recommended that at least one per cent of the budget in the first year, progressively increasing it to three per cent in the terminal year of the plan period, should be utilised for promoting and implementing e-governance.

It is strongly recommended that e-governance of the state should be implemented in a holistic and integrated manner through a monitoring cell, with

defined rules and procedures based on principles of equity, responsibility, transparency and accountability. It should be able to monitor the performance and the status of all the projects, departments and ministries against the set targets. In case of non-performance, the monitoring cell will receive an alert signal and an explanation of the cause of the failure.

IT For Masses

IT for Rural Development

The special IT Task Force, constituted by the Government of India, has recommended the use of state-of-the-art information technology for the development of agriculture and rural development, on the lines of the successful Warana project in the Kolhapur and Sangli districts of Maharashtra. The project aims to utilise IT to increase the efficiency/productivity of the existing co-operative enterprise, by setting up a computer communication network and create a data-base of villages on different socio-economic aspects such as health, education, water supply, sanitation and population. It also provides information on agricultural-related schemes, employment generation schemes, and government procedures for getting ration cards, birth and death certificates etc., to the villagers.

For accelerated socio-economic development in Himachal Pradesh, where the rural population constitutes 90.20 per cent of the state's population, it is recommended that the concept of Community Information Dissemination Centres (CIDCs) be implemented at block/*panchayat* level. This will necessitate the setting up a computer centre at every panchyat, which is to be linked with the server located at the block level. This whole network will be connected to the state headquarters. This will facilitate both government-public interface and effective dissemination of information related to the 29 subjects transferred to the *Panchayats* under the 73rd Amendment to the Constitution. CIDCs will also function as IT kiosks and will provide direct linkages between the masses and the government. CIDCs will further organise training of *panches* and *sarpanches* in the use of IT and its benefits for their day-to-day requirements. This project is essentially on the lines of "Samadhan Kendras' project implemented by the Rural Electronics Division of Department of Information Technology, Government of India in North-Eastern states. For this whole project, a detailed financial and technical report needs to be prepared with the basic aim of its long-term self-sustainability.

CIDCs will also help in improving productivity and performance of agriculture. Support and services of various stakeholders and extension agencies, such as Himachal Agriculture University, Palampur, State Agriculture Department, Mandi Board and other agriculture-related agencies/industries should also be taken up for updating the latest information on products and services, new technologies and practices.

IT can be used in all aspects of agriculture. It can play a major role in crop management, enhancing productivity and crop yields through information on farm practices, seeds, other inputs of production, weather information, better pre- and post-harvest management, water utilisation and management, pest and disease control, etc. IT applications can be effectively used, particularly in Himachal, for management and monitoring of environment resources, pollution warning systems, environmental emergency management systems for floods, forest fires and other natural disasters. IT can also be suitably employed in small and tiny industries for online and real-time information to help small and marginal artisans in their sales and marketing efforts. This will not only help them earn better and boost their morale, but preserve these rare skills, which otherwise are on the verge of extinction.

IT Education for Masses in Rural Areas

The Government of India has proposed the setting up of a network called *Vidya Vahini* to carry the benefit of IT to students. Under this programme, schools and higher learning institutes are proposed to be connected with an integrated voice, data and video network. The Government of India has proposed to introduce this programme in two phases. In the first phase, i.e., in the first two years of the plan, 60,000 schools are proposed to be connected to the network. Himachal should get 5,000 schools networked in the first phase and 5,000 more in the second phase. It is also recommended that all these schools should be only in rural areas. Timely and speedy implementation of the project by the state will go a long way in furthering the use of IT for the masses.

IT Infrastructure

Sound IT infrastructure is the key to the growth of the IT software and services sector. Himachal Pradesh already has one of the finest telecom infrastructures in the country with all digital interconnected optical fiber cable laid (OFC) telephone exchanges. All the districts have 2 Mbps connectivity and blocks headquarters at

least 33 kbps. The strong telecommunication facilities are a shot in the arm for developing the IT software and service industry, including distance learning and the implementation of the IT policies for the masses.

The state government has established a Software Technology Park and an Earth Station at Shimla, which are proposed to be co-located later with hi-Tech City. An international gateway has also been commissioned at Shimla for providing reliable speed data communication. All such facilities are likely to facilitate IT related activities in and around Shimla, making it the IT hub for the state. The State is also developing an IT hub in the Solan district on Shimla-Kalka highway, about 25 km from Shimla. It has earmarked 174 acre of land with all the necessary infrastructural facilities for attracting IT related investment. The much-needed upgradation of three existing airports in the state at Shimla, Kullu and Kangra should be taken up at a fast pace.

However, to attract reputed Indian software companies and MNCs to the state, it is essential to market and promote the state in terms of its existing and proposed infrastructure.

Development Strategy and Recommendations

Existing IT Models in Different States

Bangalore Model

Karnataka, in spite of low incentives, continues to be one of the most favoured places for software companies. Bangalore has grown on the strength of private sector rather than market-friendly state government policies. The government in its role of an infrastructure provider failed, though, government-promoted knowledge institutions have acted as catalysts in the explosive growth of IT in Karnataka. For sustaining a knowledge cluster, a superior social and business infrastructure is a pre-requisite in the long run. Bangalore has grown steadily with an initial thrust from Indian companies like Wipro, HCL, Infosys, followed by MNCs setting up their development centres

Andhra Pradesh (AP) Model

It offers an interesting model, which is quite different from Karnataka. Here the government initiative has been the engine of growth, to which the private sector responded very positively. Historically, Hyderabad has never been a knowledge hub, but because of the proactive approach adopted by the state it has been able to attract world IT players like Microsoft, Oracle, IBM and GE. The government has moved towards creating

knowledge-based human resource required for the IT industry, by setting up apex institutes like IIIT and Mckinsey Institute of Management in Hyderabad, to produce necessary human capital. Further, to build an IT culture, the state has taken many dynamic measures such as making computer education compulsory at primary and secondary levels of education. The growth of the IT industry in Andhra Pradesh proves that state-government initiative can go a long way in building an IT base in a state.

Maharashtra Model

Maharashtra in spite of being an early starter, has lost it importance as an IT destination, because of the high cost of living and high operational cost for running any unit, although SEEPZ is one of the largest and oldest software parks in Mumbai and has been a trend-setter in the country. It still employs more than 8000 software professionals and has software exports of more than Rs. 10,000 crore every year.

Delhi/Noida/Gurgaon Model

Uttar Pradesh (Noida), Haryana (Gurgaon) and Delhi have developed in last couple of years into a pocket of IT excellence. The Golden Triangle of Noida, Gurgaon and Delhi have been very successful in attracting many IT companies especially ITES companies. This is due to its proximity to Delhi and its well-developed infrastructure. The area offers comparatively lower infrastructure cost and has been able to attract and retain skilled manpower.

Model for Himachal Pradesh

Taking into consideration the various factors involved, it is suggested that HP may follow the extremely dynamic model of Andhra Pradesh to spur the IT sector in the state with necessary local-base variations. The state has to lay more emphasis on developing IT for the masses and high quality human resource needed for IT.

The State Government accepted the recommendations of NASSCOM and announced the Information Technology Policy 2001, wherein most of the recommendations suggested by NASSCOM were accepted. The State has also taken some initiatives in IT infrastructure, IT Human Resource Development and e-governance. The National Informatics Centre (NIC), HP Unit has played a pivotal role in implementing some of the e-governance projects in the State. However, if we compare the projections made by NASSCOM and the achievements made by the state so far, there is a huge

gap, which could be attributed to the widening resource gap in terms of financial allocations made by the state government and the availability of human resource.

The projections for the IT industry In Himachal Pradesh by 2009-10 needs to be reduced to one-third of what has been recommended by NASSCOM. Even to achieve the revised projections, the state must focus on high-grade human resource development and high quality infrastructure. The state must make concerted efforts towards the following:

- The government machinery of the state government has to become proactive and aggressively market the state in terms of the infrastructure offered and the conducive atmosphere for setting up IT industry in the state. The state needs to have a conscious policy to welcome private initiatives.

- The State's development strategy should be to develop quality human resource for the IT industry. Draw a charter for implementing the training programme, regular interaction and exchange with institutes of higher learning in India and abroad to upgrade the professional level of existing faculty to meet the international standards. Set up a statutory body like the State Council of IT Education to monitor the quality and standardisation aspects in both government and private institutions.

- Set up an Indian Institute of Information Technology (IIIT) in the state to meet its demand for high-grade human resource. A proactive policy with attractive incentives should be formulated so that private sector particularly, reputed IT companies come forward to setup institutes of excellence in the state.

- The State has to lay more emphasis on socio-economic development in rural areas and for this the concept of Community Information Dissemination Centres (CIDCs) should be implemented by Rural Development department after preparing a detailed financial and technical project report, keeping in view their long-term self-sustainability. HPSWAN infrastructure project, conceived with the primary objective of ensuring linkages with the rural areas, once completed, will pave the way for implementing CIDCs.

- The State must pursue Vidya Vahini Programme recommended by the Government of India for setting up an education network. The state must plan for 5000 schools in the first phase and the same number in the next phase. These schools should only be from rural areas.

- The successful implementation of Lokmitra project in Hamirpur district should be replicated in other districts of the state. E-governance is to be implemented in a holistic and integrated manner through a monitoring cell, with defined rules and procedures, based on principles of equity, responsibility, transparency and accountability.

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