

Information Technology and the Industrial Sector of Nepal

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INTRODUCTION

Information Technology (IT) is relatively a new phenomenon in the industrial sector of Nepal, especially with regard to small and medium industries (SMIs).

The major objectives of this article are to briefly review the industrial sector of the country, examine the impact of IT, describe the problems encountered with IT applications, assess the government support for IT applications, and suggest measures.

INDUSTRIALIZATION IN NEPAL

Industrialization in Nepal began only after the country opened its border to the outside world in 1951. The first rudimentary industries were in agro-processing (grain husking, oil seed extraction, jute processing, tea production and lumber milling) followed in the sixties by basic construction material production and some import substitutes such as beverages, cigarettes, textiles, agricultural tools, furniture and domestic implements. Recently, an export-oriented carpet industry and a nascent mining industry, based primarily on magnesite extraction, have emerged and show potential for continued growth. Yet contribution of industry to Nepal's GDP has been estimated to be around 6 percent. Furthermore, the sector generates only limited employment.

The industrial structure is characterized by small establishments, highly disbursed geographically, dwelling in a penumbra between the formal and informal sectors of the economy. About 95 percent of all manufacturing establishments are cottage industries which employ about 90 percent of the persons engaged in manufacturing but contribute only about 20 percent of manufacturing output. The bulk of value-added in manufacturing comes from medium to large-scale licensed enterprises, many of them in the public sector and mostly concentrated in the Kathmandu Valley or the Terai. The manufacturing census of 1986/87 has disclosed the operation of 3633 manufacturing establishments in the formal sector and of the total manufacturing establishments, nearly 85 percent were cottage and 11 percent were small scale enterprises. The major goods produced by the manufacturing sector include sugar, tea, cigarettes, jute goods, synthetic clothes, soap leather, matches, paper, cement, bricks and tiles and steel utensils.

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The Industrial Policy of 1992 has classified industries based on products and according to scale. These classifications have been then used in applying specific policy-based incentives. The product-based classifications include: a) manufacturing industries, b) energy-based industries, c) agro and forest-based industries, d) mineral industries, e) tourism industries, f) service industries, and g) construction industries. On the other scale-based classifications include: a) cottage industries which fall into three categories, reflecting the type of activity and the scale, as measured by the amounts of raw materials used and capital employed, b) small scale industries which include activities with fixed investment not exceeding Rs. 10 million, c) medium scale industries which include industries with fixed capital investment between Rs. 10 million Rs. 50 million, and d) large scale industries which include all activities with fixed capital investment of more than Rs. 50 million.

Several constraints to the growth of Nepal's industrial sector can be spelled out. These include a limited natural resource base, small domestic effective demand, collateralized credit, scarcity of skilled managerial work force, lack of reliable power supplies, and an isolated landlocked location coupled with a rugged terrain that constrains access to inputs at a competitive price.

Despite various policies and programmes of the government to create industrial awareness in the country, the climate for industrial development has not been congenial. The SMIs have not paid attention toward modernization and technological upgradation aimed at improving productivity, efficiency and cost effectiveness. Not much attention has been given towards encompassing efficient technologies and developing suitable manpower to operate and run them.

INFORMATION TECHNOLOGY AND ITS IMPACT

For most purposes, when one talks of *information technologies*, one is referring to a particular class of technology-based tools. These are the *electronic*, informatics-based tools which manipulate and communicate digital information. These tools collect, process, store, retrieve and transmit the bits and bytes which represent information. In fact, these days, *information technology* and *computer technology* are sometimes taken to be synonymous.

The IT revolution is fed by a number of technological breakthroughs. The fruits of these technological breakthroughs make possible a marriage between the information processing capabilities of modern computers and modern telecommunication systems, capable of high-speed, large-volume data transmission.

With hardware becoming less expensive, and software easily available, computer installations are increasing at a rapid pace. computers are providing invaluable assistance to designers of industrial products, architectural edifices, consumer conveniences and artistic ventures. They are also being cropped in to be part of assembly lines in industries. However, the presence of a computer has not guaranteed improved productivity. This is largely due to unawareness of how to use the computer (i.e. operations) and / or how the computer can help in solving problems (i.e. application).

The very introduction of the information and allied technologies is going to open up vast new areas not hitherto seen. Management of these technologies and controlling them to ensure that the customer or the consumer keeps on getting all the products and services without any hitch would need new skills. If the requirement of those equipped with traditional skills is diminished, demand for those armed with newer skills is likely to increase at a faster rate. Facilities would, therefore, have to be created and nurtured to **train people to acquire these new skills and improve them further. The training sector itself would have to develop new skills commensurate with the new tasks on hand. That too would open up opportunities for employment.**

The impact of IT on social, economic and cultural life in developing countries has been extensively debated by social scientists. It is reasonable to expect social and cultural consequences early in order to minimize unforeseen negative developments. First is the question of employment. It is important to distinguish the impact at the micro or enterprise level, where employment might be adversely affected, and the impact at the macro or country level, where the introduction of IT might open up new avenues for employment in other sectors. Wherever there is technological change, it leads to some structural imbalances, demanding structural adjustments. If a static view of the impact which emerges from the introduction of IT is taken, then it leads to **unemployment in certain sectors. However, in the context of the overall economy, IT can fuel growth and hence create the potential for more jobs.**

Second, and on the positive side, if labor, capital and technology are integrated in a balanced proportion, IT could make the economy active, improve the quality of life, and create new wealth through increased productivity. Third, and on the positive side, with computers and telecommunications introducing voice data, images, etc. across national frontiers, the concept of national boundaries will change. The volume of information flow will increase, increasing people's access to information at various levels.

With the extensive utilization of IT in the industrial sector new possibilities could be opened up to enter into specific categories of manufacturing without the need to make large-scale investments of heavy equipment and other physical infrastructure.

Problems of Information Technology

There are various obstacles in the promotion of IT applications in the SMIs of Nepal. The managers of business and government organization are not very aware of the possibilities of improving their efficiency through IT. In the government-owned SMIs, due to various political reasons, the number of persons employed is much higher than required. Consequently, the SMIs generate less profit. Further, IT has not been applied to a large degree since the management fear that this could imply an increase in unemployment. Nonetheless, new jobs can be created for the development of software. For instance, a few small software houses are being established in the country.

There are other weaknesses and constraints in the capacity of Nepal to access and make use of international information. A principal impediment to the introduction of IT in Nepal is the paucity of infrastructure. This ranges from inadequate and unreliable

electric power supplies to insufficient institutional mechanisms and procedures to manage and provide services. The lack of an adequate nationwide telecommunication network is also a major constraint.

The availability of sufficiently trained manpower is another essential element that is missing in Nepal. For Nepal, the question is not whether to make or buy the equipment, but to what extent to train professionals in the computer and telecommunication fields and in methodologies for planning, design and implementation of these technology applications. The goal should be to spur the externalization process, i.e., the development of a wide range of professional and support services that can enhance the competitive positioning of a country's economy and its quality of life.

Another problem is with regard to information from remote areas that are largely transmitted through the telecommunication media. So far, it is noticed that the telecommunication line for speech communication has performed quite well; however, the line for data transfer, the case of fax need to be mentioned. Fax is one of the easiest method of information transmission. However, it has a major drawback for not being able to integrate with the database. Optical Character Recognition (OCR) package can be used for direct assimilation of fax data into the database. But, OCR is rarely used in Nepal. Currently, one of the principal hindrance with the existing fax machine is the absence of answerback. Because of this, there is no automatic verification.

In Nepal, there are great prospects for export of various products such as jam, canned fruits, dry fruits, handicrafts, hides and skins, silver jewellery, and woolen clothes, among others. But due to lack of information about potential markets, international and sectoral demand, prices and quality standardization, exports have not reached the target desired. IT could play a major role in resolving this problem.

Security and control are essential elements of IT. Certain considerations should be made for providing security and control for small installations in SMIs. In such installations chances are greater that the staff may be limited in size and in the level of skills. This can present problems in achieving an effective separation of duties between programming and operation, and between data control and computer operations. This is because in such installations the same individuals perform several of these functions. In such instances, periodic audit of activities is very important. Where internal audit capabilities do not exist, the management should be made responsible for checking the data processing activities. A control desk should be established in every user department which has important or sensitive systems. This applies, of course, to payroll, accounts payable, store inventory, market information and disbursement functions, among others.

There are many other weaknesses and constraints in the ability of Nepal to access and make use of international information. These include: a) inability to adapt available information for new purposes; b) unwillingness on the part of some information sources to share information; and c) poor scientific and technological levels and dearth of strong research and development capacities.

GOVERNMENT SUPPORT AND TRAINING PROGRAMMES

In Nepal, the application of IT in the SMIs has been very low. Very little support has been granted by the Government. For instance, it has reduced the custom duty levied on computers to 15 percent of the f.o.b. price. Computerization has been introduced in the services sector, especially in the banks, a few hotels and travel agencies.

For the effective use of IT, training is required in; (i) telecommunication network, (ii) software development, (iii) system development, (iv) hardware maintenance, (v) production planning and controlling, (vi) marketing, and (vii) management.

Due to scarcity of skilled persons having higher education in IT, the management in a few service sectors have a practice of selecting potential candidates with strong aptitude from among the existing staff for the job categories at the pre-training level. Then, they have been given extensive training for positions of computer operators, systems analysts, and programmers according to the qualification and aptitude. With regard to the organizations of the service sector, at the initial stage, they depended partially on the computer manufacturer, but with the passage of time, they have been developing skills in their respective organizations to meet the long-term requirements.

Prior to the Industrial Policy of 1992, no policies were ever announced and implemented by the government with reference to IT. Even the Industrial Policy of 1992 is not very clear. According to this Policy, a Technology Development and Transfer Agency would be set up to make the process of technology development and transfer more effectively and to support the industrialization process through proper import, development and management of the technology. It would distribute the information and relevant statistical data on technology and technology transfer to the industrialists free of charge. Provision would be made to render electricity and communication facilities to the industries. Further, an institutional arrangement would be made to provide facilities for the skill development training, management training, technical and consultancy services, machines and equipments, raw materials and marketing network for the products in an integrated way for the cottage and small scale industries based on local raw materials and labour. Industrial Manpower and Productivity Council would be established with the representation of the government employees and the private sector to make the industrial sector more efficient and productive.

It is also significant to note here that one of the objectives of the Foreign Investment Policy of 1992 is to augment productivity by mobilizing internal resources and materials in productive sectors and by importing foreign capital, modern technology, and technical skills. Under this Policy, foreign investment would be permitted up to 100 percent in large and medium scale industries. Moreover, permission would be granted for the transfer of technology in cottage and small industries.

Hence, with the dawning of the new era in Nepal and the subsequent emphasis on liberalization, privatization and foreign investment, IT may be applied quite extensively in the industrial sector of the economy during this decade.

CONCLUSIONS

Before providing some concrete suggestions, it is useful to mention the case of carpet industry which has emerged as a lucrative industry during the past few years. The success of the industry, it is believed, depends to a large degree on the patterns of the carpet. Carpet designing is a very creative and innovative act which requires huge amount of money and time. At present, only a few carpet factories are employing computers in areas such as accounting and production planning and controlling. They are not able to use computers for designing purposes due to nonavailability of appropriate software.

Nepal, in its quest for applying IT widely in the industrial sector, needs to make major efforts in the following areas:

- Infrastructure which implies dependable and constant supplies of electricity and extension of the modern telecommunication system to the rural areas.
- An institutional structure to plan, promote and coordinate the development and application of IT.
- An educated and trained labor force.

An IT strategy has also to be backed up by necessary legislation and regulations in order to protect the country and the consumer. An important element is setting standards and devising rules to enforce them including technology standards for data, software and hardware and operational standards for documentation and procedures. These standards should be clearly defined, enforced and regularly reviewed and updated.

SELECTED REFERENCES

- Bhalla, A. D. James and Y. Stevens. (eds.) (1984), *Blending of New and Traditional Technologies: Case Studies*, ILO, Geneva.
- Cutajar, M. (1985), "Towards an Alternative Information Order," *Development: Seeds of Change*, No. 1, pp. 3-7
- Foster, F. (ed.) (1981), *Informatics and Industrial Development*, Tycon International Publishers Ltd., Dublin.
- Fransman, M. (1986), *Technology and Economic Development*, Wheatsheaf Books, Brighton, UK.
- Ministry of Industry (1992), *Industrial Policy 1992*, Ministry of Industry, Kathmandu.
- Wellenius, B. (1984), "Telecommunications in Developing Countries," *Finance and Development*, IMF/IBRD, September, pp. 33-36.
- Zorkeczy, P. (1982), *Information Technology: An Introduction*, Pitman Publishers, London.