India and the Challenge of New Technology

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The future is essentially unpredictable. This is truer today than twenty years back. And that is due to the rapid acceleration of the scientific and technological revolution.

Twenty years back, the class rooms moved from mechanical calculators to electronic ones. In 1980s, the PCs entered the scene, pushing back the electronic calculators. Ever since then, we are having a revolution every year. Tapes were replaced by hard disks and floppies. Floppies by CD ROM's, and now CD ROM's by tape drives. Computer technology is getting outdated by the year. Each year brings with it new learning, new technology, new promises.

However this rapid acceleration has now begun to reveal the faint outlines of the distant future. At least three major revolutions seem inevitable: the bio-tech revolution, the info-tech revolution and the energy revolution.

The bio-tech revolution

The bio-tech revolution is developing out of an application of technology to biological processes. New genetic strains of plants are being developed, as are biological pesticides and fertilisers. Already bio-phosphates have been introduced into agriculture in some districts in Andhra Pradesh. The scope for these biological inputs will expand as petro-based inputs become costlier. Similarly, bio-tech alternative agriculture based on tissue culture can become viable if conventional agriculture becomes too costly.

Thus the bio-tech revolution may replace petro-based inputs and even conventional farmers in the future! *No one is indispensable in the modern age*. However, the relief that the revolution promises raises its own problems. Whereas it checks the environmental pollution caused by chemical inputs, it can break the ecological balance developed by nature. And what is to be done with the conventional farmers who constitute about 30% of India's work force?

The info-tech revolution

This revolution symbolised by the PCs, faxes, e-mails and satellite communications underlines the same message: *No one is indispensable in the modern age*. It threatens all those employed in handling information from the subordinate executives, to the clerk in the office, and to the teacher in the class room.

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The info-tech revolution cuts into the power of all handlers of information. They will not all be displaced. But their power over information will now be lost. Computers will end *file-power*. And with *file-power*, will decline the numbers and strength of subordinate white collar employees. Similarly, tele-conferences will reduce the autonomy and power of subordinate executives.

Much of the conventional teaching can be handled by computers. Already, the computers offer inter-active teaching in maths, physics, chemistry and biology. And this teaching comes with visuals that no private tutor, or even many class rooms can provide. Today, this costs less than 50,000 Rs. Tomorrow, it will be still cheaper and better. Mechanical knowledge will be better provided by machines. Most teachers will be better than machines only in imparting human values.

The info-tech revolution does not stop only at desk jobs. All information that can be processed mechanically can be handled by it. This affects not only typists and clerks, but also the 'hewers of coal and the drawers of water'. Mechanical work can be automated. Automation will become cheaper as the info-tech revolution accelerates.

The energy revolution

The unlimited desires of man contradict the limited capacity of mother earth. This contradiction is underlined by the exhaustion of non-renewable energy resources, such as coal and petroleum, and the pollution caused by their overuse. The movement to solar and water power will help to transcend this contradiction. The growing viability of these energy alternatives is announced by the development of solar powered transport. When the electric car comes to India, can solar cars be far behind?

Neo-imperialism and the technological revolution

All the three revolutions have a foreign centre. Foreign private capital has invested heavily in technology. This is particularly true of the United States. American capital is increasingly shifting to technology, entertainment, and services, faced with competition from other developed and newly developing countries in conventional areas. These and armaments are its priority areas in international trade. There is even a deliberate move to shift the production of the highly polluting conventional goods to the peripheries. This will keep America clean and prosperous.

To join or not to join?

The first question raised is: should we join this race for modern technology or not? Joining seems inevitable since the costs of keeping out of the race are prohibitive.

The gulf war was won by the USA on the strength of the info-tech revolution. Our ability to win wars decides the durability of peace in our region. This will largely be decided by our command over the info-tech revolution. That is why the Americans denied us the super-computer. If we do not develop our own expertise, we may cease to exist as a single nation.

Bargaining power

Late starters lose bargaining power. This has been the lesson of the industrial revolution and the silicon revolution. Japan joined the both revolutions early, and established strong bargaining power. Russia joined the second later, and was driven to its knees. Join now to bargain better. Those who come late have to come with a begging bowl.

Protecting the environment

Conventional technology is highly polluting and resource exhausting. India, which supports 16% of human population on 2% of its land surface, is short on environment as well as natural resources. Another fifty years of 'progress' with the current technology may ravage this country beyond repair.

Globalising with national interests

Although we have to run the race, we don't have to run blindly with the rest. To the extent possible, national interests must be kept in mind. To the extent possible, because our economic and political weakness makes us more vulnerable to foreign pressures, than for instance, a hard state like China.

Two aspects are particularly important: political control and employment.

Information and control

Information is power. The info-tech revolution centralises access to information, thereby concentrating the powers of government which are presently diffused throughout the state mechanism. Such a concentration of powers can be used for public benefit in responsible, democratic and clean hands. But not otherwise.

Modern info-tech channels are open to hackers. Recently, the Pentagon was raided by a private operator. What one individual could do, any organised power can repeat.

Centralised information can become accessible to foreign channels, facilitating government from a distance. *Indian government can be brought to foreign doorsteps*.

Efficiency and employment

Finally, efficiency increase must increase employment *over all*.

An employment-efficiency trade-off generally exists in large organisations. Until computerisation and automation got underway, there seemed to be no way out. Now, the

trade-off can be exploited by computerisation and automation, in order to increase the efficiency of the organisation. What we have to ask is whether we want such an increase in efficiency.

Efficiency can be unnecessary. This is so, if it has no indirect productive or employment effects. In a labour surplus country, we must learn to accept such an inefficiency. An increase in efficiency is justified only if it increases the production or employment in other organisations more than it cuts back employment within the given organisation. Only then are computerisation and automation justified.

Defending nationalism

The political aspects of the impending revolutions can be left to the state and the political processes. However, they must be backed by popular vigilance.

Economic nationalism cannot be so left to the state. The state as well as the political processes are suffering from an overload of pressure points communal, caste, regional, and class adding on to open terrorism and silent subversion. Moreover, a soft state cannot bargain freely, even if we grant it the will to do so. So what is needed is a social movement of economic nationalism.

Consumer and producer nationalism

Economic nationalism includes the right of a people to livelihood. Economic independence is as important as the right to employment. Both have to be defended by a heightened consciousness of producers and consumers. *Heightened consciousness is consciousness that translates into daily life*.

Efficiency, quality and cost effectiveness are the concrete forms of heightened producers' consciousness. They are also the best argument against computerisation and automation. In order to be credible, they must appear long before the threat of displacement.

The act of consumption is not a private but a social act. Each purchase by one individual, guarantees the right to livelihood of another. The employment chains generated by each rupee of purchase must be estimated, and the consumers educated correspondingly. The main hitch here is the absence of an appropriate data base.

Since each consumer is himself a producer, and conversely, this two-sided consciousness should not be hard to spread. Only thus can the fetishism of the commodity bred by the market system be overcome.