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**Training For The New Technologies
In Graphic Communication**

By

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TRAINING FOR THE NEW TECHNOLOGIES IN GRAPHIC COMMUNICATION

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Education and training of personnel for the printing industry, specially for the newspaper industry, in the developing countries of South Asia, have not kept pace with the advancements in printing technology. Training facilities available in these countries also vary widely from one country to another, depending on local factors.

While mass communication is playing a vital role in social, political and economic progress of these countries, more particularly in the post-war era, there has been a lack of conscious effort, both on the part of the governments and private agencies, in producing the much needed skilled technicians, technologists and professionals for the different areas of mass communication media. This lack of attention is perhaps more glaringly apparent in the area of graphic communication.

Printing is graphic communication — communicating through the printed word. With the advent of television, a very powerful audio-visual communication medium, and its phenomenal growth in the last two decades both in the developed and developing countries, almost everyone thought that newspapers will not survive the TV competition. Simultaneously, electronic publishing, satellite and telecommunication technologies made giant strides in a short space of time, which only added to the doubts expressed about the survival of the 'printed word', as a means of mass communication.

But to the surprise of all, the newspapers have not only survived, but graphic communication has gained greater strength in the battle and has proved that it will be the most enduring medium of communication for all time to come. The steady growth in the number of newspapers in recent years, specially small newspapers to cater to the needs of the rural population in the developing countries, proves this point.

The New Technologies

What made this possible? It is the same 'new technologies' of electronics, microprocessors, computers, lasers, fibre-optics and other advancements in science and technology skilfully adapted to the developing needs of graphic communication, by enterprising and sustained efforts of printing engineers and scientists, which made it possible for the printed communication to gain formidable strength even against powerful telecommunication media.

These new technologies have drastically changed the very structure of the 500-year old printing industry, transforming it from a tradition-bound, labour-oriented, skilled craft to a capital intensive, science and technology based, sophisticated high-tech industry. The advancements in every sphere of science, engineering and technology have been absorbed into the graphic communication processes and equipment to effect this radical change.

What is the impact of these new technologies on the traditional methods of printing at various levels of production and management? What differences have they made on the types of personnel required and the nature of operations they are called upon to perform? Answers to these questions and only a proper understanding of this background will help to analyse the problem of "training for new technologies", the subject of this paper.

At the outset, the major impact of new technologies on the printing industry is that quite a number of machines have had to be discarded and thrown out as museum pieces. The number of such machines is increasing, particularly in the pre-press areas where developments are taking place at explosive velocities. Many of the new techniques and processes of printing are forcing such radical changes that it will not be recognised as the printing industry known to the older generation, by the turn of the century.

New Approach Required

A welcome change is that, in the typesetting area where the major breakthrough has occurred, compared to the hot metal composing machines of yester years, the computerised phototypesetting machines cost very much less, and they are very much faster, versatile and efficient. There is no longer the dirt, the noise and the health hazard caused by lead fumes. With phototypesetting, the operators now work in air conditioned comfort, in a silent, clean atmosphere. Within the turn of the century, even these phototypesetters are likely to be entirely replaced by still cheaper and more efficient personal computers and laser printers. Incredible and unthought of developments are taking place in this area.

As a result of the impact of new technologies, the manufacture of a printed product, or the production of a printed message, in the required form today calls for a different approach on the part of managements. In the new set-up, using entirely different types of sophisticated machines, it takes special abilities and skills to make the graphic message itself and to prepare it in a form that will catch the interest of the reader -- be it a book or a commercial job, a newspaper or magazine, package printing or security printing. In the modern set-up, every printed communication is a customised product, the production of which requires a new approach, far different from that followed by traditional printers.

Rule of thumb measures that used to work in the conventional letterpress plants do not work in modern presses having sophisticated computerised equipment. Speed with better quality and higher output are the essence of modern equipment. Managements cannot afford any more to learn through trial and error methods.

Creative Dexterity

The use of sophisticated machines call for more and more mental dexterity. As a result, physical skills have given way to knowledge skills and manual dexterity is being replaced by creative dexterity based on technical knowledge and applied sciences. Operations and processes requiring such mental dexterity are steadily increasing at such an incredibly fast pace, that some new-found equipments and processes become obsolete even within a year or two, with the introduction of more advanced systems.

All these changed conditions require a reorientation of management structure, strengthening of middle management both on the shopfloor and in the office, adoption of advanced marketing techniques, building up a sound financial base and a scientific approach to all the day-to-day problems. These are conditions far different from those to which printers have been accustomed to in the past, using traditional methods.

Need for Technician Engineers

It naturally follows that the types of personnel required for such changed conditions will have to be different too. In place of 'skilled craftsmen' who were operating the traditional printing machines, modernised printing plants adopting new technologies require 'technician-engineer' type of persons with very good science and engineering background. Many operations, including those of supervisory nature henceforth will be by definition, technician duties.

As most of the modern micro-processor based machines are largely automated, self-operating and self-compensating, the technicians have to manage the machines and instruct them in the tasks they are to perform. The technicians operating the fast-running printing machines have to work behind electronic consoles, co-operating with electronic engineers and chemists to produce the best quality product possible.

The print-technicians hereafter will not only be operators of sophisticated machines, but will have to note the computer readings on the consoles, densitometers and similar quality control gadgets, interpret these readings to make necessary adjustments on the machine and changes in paper, ink, plate, etc. to maintain consistently high standards of production and print quality, under varying conditions.

For occupying positions at the middle management level, the whole field of electronic and computer applications to printing calls for a higher grade of young persons who have attained proficiency in mathematics and sciences. Similarly for occupying higher managerial and executive positions of modern printing plants, a whole new generation of graphic communication professionals, who will have a scientific approach to solving problems with more maturity and broad-based knowledge of the industry, will be needed. With the use of costly equipment, a high degree of efficiency is to be compulsory maintained at all levels of production and management, to forestall the problems and eliminate them.

Printing industry has not been attracting the best talented youngsters leaving the high schools or colleges, as the electronics and other engineering industries do. This is because there has been no scope for brainwork or higher mental abilities in the printing plants of traditional variety, as most of the operations in conventional processes involve craft-oriented manual skills only.

But in the new environment created by the new technologies in printing, there is full scope for talented young persons to become print-technicians or technician-engineers to prove their mettle and to have fullest job satisfaction, comparable to similar positions in other advanced engineering industries. The salaries are also bound to be more attractive in the modernised printing presses.

Contributory Factors

The facts detailed above just explain the changed situation that has resulted consequent to the advent of the new technologies in graphic communication. In a transition period from the old to the new, the challenges of change and the problems created by the change in technology are undoubtedly many and varied even in the most developed countries. They are naturally more apparent in the developing countries of South Asia which have to depend on the technologically advanced countries for everything — technical knowhow, expertise, equipment, training facilities and so on. But have the industries in these Asian countries paid serious attention, and taken necessary steps, to tackle the problems and face the situation boldly? Unfortunately one has to admit that they have badly failed to rise up to the occasion.

Most of the major problems faced by the printing industries in the developing countries of South Asia, in the process of modernisation, can be attributed, first and foremost, to their failure to pay attention to the training aspects, the most basic need to meet any developing situation.

The factors that contributed to serious difficulties in facing the problems of a smooth transition from a tradition-bound craft to a modern high-tech industry, can be detailed as follows :

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(a) failure to take timely action in creating training facilities to meet the changing demands of the industry for a new type of professionals to man the sophisticated equipment of the new technologies ;

(b) absence of a sound training system which could adapt itself to meet the changing trends ;

(c) failure to develop the required technical know-how and professional expertise indigenously to cope up with the radically changed conditions created by the new technologies ;

(d) failure to build up a sound information system to inform the general public and the printing community about the advent of new technologies and their impact, so as to attract the best talents to join the industry keen on modernising ;

(e) failure to develop retraining and updating facilities at a national level, for the benefit of persons already working in the industry, to meet the challenges of changing over from the traditional printing processes to the new technologies.

An Integrated Plan for South Asia

How do we go about the task of formulating plans for filling up the gaps in the training system and introducing new training programmes? What types of training courses and what types of entrants will meet the needs of printers opting for the new technologies? What are the physical facilities and infrastructure required for introducing such programmes? Who should take up the responsibility of organising the courses and managing the institutes conducting such programmes?

These questions are to be answered if we have to consider the subject of 'training for the new technologies' seriously. It should be clear that the resources required to organise the training programmes in each country on a national scale are enormous. The governments alone cannot satisfy the requirements of the industry. The industry too cannot undertake the responsibility alone.

Graphic communication and the newspaper as medium of mass communication are extremely important to every country in South Asia. Because of the enormity of the problem in raising the necessary resources required for training by any single country, even to cater to its own needs, I feel a total integrated plan should be drawn jointly by the developing countries of South Asia and the responsibility to be shared by them as a common endeavour.

The Asian Mass Communication Research and Information Centre which has already built up a good infrastructure in collaboration with international organisations in advanced countries can take up the main responsibility, on behalf of these countries, for starting an Asian Graphic Communication Training Centre in Singapore. It can conduct a variety of courses of different durations, specifically concerned with new technologies, on a continuous basis. These courses will be organised for the nationals of all these Asian countries and the faculties can also be drawn from these countries on a rotating basis, besides some experts from the advanced countries.

Retraining Programmes

As a first phase, the Asian Training Centre can take up programmes to fulfil the needs of working technicians who have had no exposure to modern equipment or new technologies. These courses will be relatively of shorter duration and will be primary for retraining and updating the knowledge of working personnel.

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This will prove to be a boon to the industry in enhancing the efficiency of existing plants without resorting to dismissals and fresh appointments, which cause avoidable human relations problems. It will be a morale booster to the information-starved technicians who are forced to stagnate at one level for long periods, to accept greater responsibilities and gain promotions.

These short courses of varying durations, depending on the area of technology and specific needs of different groups, will be conducted for :

(a) Operators of sophisticated equipment to upgrade their technical knowhow in their respective areas to improve their performance and to gain experience on latest versions of equipment ;

(b) Operators of traditional machines to gain theoretical knowledge and practical know-how in a different area to help the employers in changing over from the traditional printing to new technology without resorting to retrenchment of existing employees.

(c) technicians with Diploma education to gain practical experience in the use of various quality control gadgets, methods and procedures, to create an awareness and spread the message of quality control among the technical personnel ;

(d) shopfloor supervisors and managers to get an exposure to, and an overall view of, modern equipment and the new technologies, to help them plan diversification, expansion and reorganisation of their plants on modern lines ;

(e) office managers and executives to gain an overall knowledge of the work carried on by the production departments to help them in understanding the working problems of technical personnel and solve them expeditiously with better understanding.

Courses for Freshers

Training programmes for new entrants may be devised in a modular system to help the student move from one to the other as and when he likes, fulfilling certain basic conditions.

An orientation course of intense study for a period of six months may be prescribed for candidates without any previous exposure to printing. This course will expose the students to the basics of graphic communication subjects, giving an overall view of the new technologies. The content of the course will be more of theoretical lectures and demonstrations of all the processes.

After the completion of the orientation course, the student can go to the next phase of training for specialised study in a selected area, such as, phototypesetting, reproduction photography, colour separation, scanner operation, sheet-fed offset presswork, web offset press work, and finishing operations. These Courses, each of six months duration, will be intensely practical oriented,

For an indepth study, both theoretical and practical, in each of these subjects, to make the student highly proficient to handle all complicated jobs and to handle problem solving situations, an additional six months training may be offered. This course can be taken up by the student who has completed the previous six months course, immediately following it, or he may go back to his job and takeup the course after a period of time, according to his employer's convenience.

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