

FOCUS

The Five Freedoms of the Information Age

by AMM Aabed

Time and distance have disappeared, and size or volume is not a problem. Enjoy the freedom of restriction from space, volume, time and distance. The fifth freedom is a combination of the other four — the freedom from intermediaries

FROM inside the mosquito net in my bedroom in Dhaka I can telephone my sister residing in London and get instant direct connection (ISDN via satellite). I can use a compact cellular set, or a smaller folding, pocketable, cordless telephone the size of a small calculator. Next morning I send her a document in Bengali using my mini fax machine fitted in my home-office. This fax machine had been printing out (for the last eight years) the list of all the telephone calls made during the previous weeks, to enable me to check the subsequent telephone bill.

Sitting before my computer I can contact millions of Internet users, or send a message on e-mail within Dhaka or to any part of the world (there are several electronic-mail providers in Dhaka). My son, an A-level student, goes to the homes of his class mates to browse on the computer screen the big encyclopaedia on the CD (compact disc); and also listens to music, and plays interactive computer games with distant friends on the local LAN or local area network. Another CD and tour of India is possible as an armchair

tourist. With virtual reality, it is possible to enter a departmental store in London and do window shopping.

An Internet network user can instantly contact any one of the millions of its subscribers in any part of the world (at local call rate). The world is at his fingertips. The big players in the global information industry are urgently reviewing the changing market strategies in the information business (in the USA the information industry generates more than one half of the total business in the country). Now even the International Telecommunications Union (ITU — a specialised agency of the UN regulating the telecom standards) is getting interested in making use of the vast potentialities of Internet services.

Networking may become a booming business as the century closes. The situation is fluid with proprietary giants vying with international standardisation exercises. The popular PC or personal computer design is poised for a possible showdown — the other camp is contemplating a cheap \$500 computer to be fed via the network to the office or home (no

hard disc: no programmes to buy or store). The pace of R&D is so fast that the PC motherboard cannot keep pace with the new chips coming out (the multimedia chip, for example); so Intel has decided to make and market motherboards to match with its latest chips.

Satellite broadcasting has shrunk the world. Now direct-to-home satellite service is possible using small dish antennas; some have the size and shape of a window pane, to bring the world right into the [middle-class] drawing room.

Fixed wireless local loop telephone systems for the rural areas have sprung up in the developing countries (including Bangladesh). Cellular telephones will soon be flooding the local market through three private operators.

It is all affordable (at least in the developed countries). In this Information Age, technology is building up a new breed of information society with a differ-

ent life style.

It has blessed (!) the society with five freedoms unthinkable even a couple of decades back. Time and distance have disappeared, and size or volume is not a problem. Enjoy the freedom of restriction from space, volume, time and distance. The fifth freedom is a combination of the other four — the freedom from intermediaries — go direct to the objective without any via media.

The computer can now replace the human secretary in the small home office (SOHO): the vertical hierarchy is becoming redundant during working or business hours. It is horizontal or peer-level relationship. It reminds of something elusive — democracy in action!

A new trend is slowly emerging in the industrialised countries. The employment pattern is set to change. The work-place is being decentralised. Part of the daily workload can be taken home, and returned to the office

through electronic means.

It means 20 per cent saving in the travel time between home-office. In fact the researchers have found that productivity or output while working at home increases by 80 per cent, due to less distraction, interruption, and interaction.

The employer-employee relationship is set to change, analysts feel. Less permanent jobs will be available in the offices of the future. More work will be given out of contract basis. So an employee may work for several offices in different fields. Corporate loyalty will be at stake. This trend is already creeping in Dhaka. Small consultancy agencies or offices are employing multi-working resource persons project-wise. It is expensive to have an expert on the payroll full-time for months.

The educationists are examining the impact of future employment pattern on existing

secondary education, to enable the youth to enter the new world mentally prepared. It is the age of change, controlled by electronics.

Watch the acronym SOHO. It stands for small office, home office. The latest computers are being designed for such users: as also for multimedia applications right in the drawing room. A small computer remote-control hand-held device takes over the home entertainment requirements for each individual in a family for all the rooms. One watches TV on the monitor, another plays games in his room, others are busy with the computer, VCR, audio cassette, or cable TV. The family does not sit together. Good or bad?

The cashless society is another benefit (or bane) of the IT revolution. Insert the credit card into a machine in a foreign country and find out the balance in your account in your country. While in Singapore,

for example, one could draw cash after the electronic system checks the person's account in Malaysia — currency in cash without boundary.

The latest fax machines now have multi-functions: it can also work as a computer printer, a copying machine (plain-paper), and as a scanner to insert text or graphics into the computer. The machine works as a telephone and doubles as an answering machine, and records the incoming messages. It goes into the sleep mode, and wakes up on receiving a call, using less power.

The chemical camera film is going out of date. Photographs taken with the computerised disc camera can be stored in the hard disc of the computer, then edited and enhanced, before getting the colour print-out from the jet printer (or on the fax machine described above).

As an example of older technology applied at local level, the recent broadcast relays of the parliamentary debates on the radio and TV networks in Bangladesh had tremendous impact on the voters all over the country, especially in the rural areas. The power of information is too powerful to be ignored. In the third world, due to low literacy rate, television exerts considerable influence as

a mass medium — the foreign satellite transmissions feed through the local cable networks are changing the mores of the conservative society.

The philosophical question now being debated at the intellectual level is whether too much bombardment with news and information disintegrates or destabilizes a society. There is a nasty side effect: a lot of electronic garbage is produced and exposed to unwilling viewers. Too much garbage is good neighbor for the body nor for the mind. The acquisition of knowledge is a one-way action in the sense that the resulting change in consciousness is irreversible. How to "dis-inform" a person has become a topical and philosophical issue.

The new informatics is convergence technology in action in the Global Village. Time, space, and volume have been squeezed into micro dimensions in a decentralized society. Is this going to be the life style in the 21st century?

There is no definitive answer, as technology is outlasting applications of the new knowledge. Beware, he or She may become IT, or dehumanized! — Dharitri feature

The writer works in the IT sector.

Role of Biochemistry in Food Processing: Problems and Prospects of Industry

by Dr S F Rubbi

FOOD processing in industry provide the most favourable stimulus for manufacturing sector. Its growth implies the expansion of all activities that supply inputs to it. The intervention of food industry is imperative to maintain and improve health status by making available more food in different forms. Food processing should be based on a profound understanding of the physical or biochemical mechanisms underlying the process.

In the natural state most foods can be kept for a certain period if they are harvested in good condition. Cereals, legumes and oilsseeds are low in moisture when harvested and require minimal processing. Foods with high moisture like fish, fruits and vegetables, commonly known as perishable commodities, require proper handling and processing for their preservation.

Deterioration and spoilage of foods: The causes of deterioration and spoilage of foods include growth of microorganisms (most common with moderate to high water content), contamination — (fifth, absorption of off flavours and odours), normal respiration (plant tissues), loss of water, sprouting, autolysis (especially fish), various chemical reactions (oxidation), physiological disorders (chilling injury, cold shortening of muscle, scald of apples, anaerobic respiration of plant tissues) and mechanical damage.

Preservation: The aim of commercial preservation is to ensure wholesomeness, nutritive value and sensory quality of food by economical methods which will control growth of microorganisms, reduce chemical, physical and physiological changes of undesirable nature and obviate contamination.

Preservation of foods can be accomplished by: a) biological preservation — alcoholic and acidic fermentation; b) chemical preservation — addition of sugar, salt or acids and exposure to smoke or fumigants; c) physical preservation — increase of temperature in product energy (heating, irradiation), controlled reduction of product temperature (chilling, freezing), controlled reduction in products water content (concentration, dehydration).

Besides traditional fermented products milk products, soya products, idli, flavouring compounds can be produced by fermentation process with the

aid of genetic alteration. Many gums used in food processing can be produced by bacteria.

Chemical preservation: Sugar used in concentration of 70 per cent or above preserves, by osmosis, most foods such as fruit, jellies, jams etc. against most organisms. Sugars with acid and pectins form gel structure. Salt and acetic acid in concentration of 15 per cent and 1 per cent respectively can preserve most foods by osmosis.

Smoke provides phenolic compounds which protects the food against bacteria and contributes typical smoky flavour.

Physical preservation: Physical methods of preservation result in death of microorganisms by temporary increasing the energy level of a food which is suitably packaged to avoid recontamination or suppression of their growth (by maintaining the food at sub-ambient temperature or by removing water followed packaging to avoid readorption of water). None of these methods can completely stop chemical and physical changes, although these methods can stop or greatly retard the growth of microorganisms.

In frozen foods stored at 18°C recommended temperature, microorganisms cannot grow but degradation of vitamin C, insolubilization of protein, oxidation of lipid and recrystallisation can occur at sufficient rate. They have also some undesirable consequences on the sensory and nutritive value of food. Thermal sterilisation softens food tissues, degrades chlorophyll and anthocyanins, alter flavours and results in loss or degradation of substantial amount of vitamins. This shows that none of the processes are perfect — one has to increase the advantages and decrease the disadvantages.

Packaging: It protects chemical, physical and biological mechanisms of food deterioration by controlling the effect of light, O₂, water temperature, attack by biological agents. It also serves as a processing aid like metal can for sterilization. It serves as a material handling tool containing desired unit amount within a single container, marketing aid, convenience item for consumer and can also be a cost saving device.

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ensure that the product could be manufactured to a consistent quality from available materials under safe and hygienic conditions. It involves three kinds of variables: i) control of quality of raw materials; ii) control of critical points in the process; iii) control of finished products.

The rapid growth of on-line quality control systems will continue. Instead of controlling the end product, the process will be controlled, where necessary corrected. In this way production problem is minimised. Total quality control (TQC) encompasses eight stages of the product life cycle — i) marketing, ii) engineering, iii) purchasing, iv) manufacturing, v) inspection and test, vi) shipping, vii) installation maintenance and service.

Quality planning is the heart of TQC, directed towards preventing quality problems and it includes: i) establishing quality guideline, ii) building quality into design, iii) procurement quality, iv) in-process and finished product quality, vi) inspection and test planning, vii) control of nonconforming materials, viii) handling and follow-up on customers complaint, viii) education and training on quality.

Effect of Processing

Biochemistry plays a very important role in determining the quality of raw materials, the nature of spoilage and development of appropriate method for processing and preserving.

Biological preservation — alcoholic and acidic fermentation: Fermentation is the decomposition of carbohydrates by enzymes and microorganisms into substances which when present in sufficient concentrations, prevent the growth of spoilage organisms. In the primary or alcoholic fermentation, simple sugars in a product are converted into alcohol by yeast, as in the production of wines and ciders. Yeast must be excluded from such fermented products to prevent further attack by aerobic organisms, e.g. bacteria, moulds etc.

Vinegar fermentation is brought about by acetic acid bacteria after the normal alcoholic fermentation. Vinegar (acetic acid) produced helps in preserving pickles, due to its antimicrobial action. In lactic acid fermentation, hexose sugar is decomposed into lactic acid which helps in the preservation of sauerkraut, pickles etc. The product must be sealed from air to prevent the growth of acid destroying bacteria.

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