

Modern Technology – Bless or Curse.
"Could the world be said to be enjoying the fruits of modern technology, or conversely, 'holding a demon by the tail' ?"

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Abstract

Revolusi Industri pada abad ke 18 sebagai awal dari teknologi modern:dimana terjadi perubahan drastis dalam cara manusia memproduksi,dimana tenaga otot diganti tenaga yang didapat dari bahan bakar fosil, proses mekanisasi.Perubahan berlangsung sampai sekarang dengan akselerasi yang makin tinggi, sedemikian sehingga disamping manfaat sebagai berkat, teknologi modern membawa dampak negatif yang sangat serius dan bersifat global, beberapa menyebutnya sebagai kutuk. Tulisan ini membahas prestasi yang dicapai dalam penerapan teknologi modern, juga dampak negatif dan prospek kedepan yang dijanjikan bioteknologi modern untuk memecahkan masalah tersebut.

Introduction.

Technology is the use of methods and tools by mankind to do things in serving mankind. Technology itself and the development of it, are an integral part of mankind. In the early history of mankind, humans had already used tools rather than bare hand. It is the characteristic that differentiates mankind from the animal.

The Industrial Revolution began in the eighteenth centuries and is regarded as the embryo of modern technology. Then technology has developed at an accelerating speed, until people realize that other than tremendous benefit for mankind, modern technology bears a massive destructive risk to mankind and other creatures on planet earth. Those negative aspects are so serious that some people are skeptical, even against technology.

This essay discusses the actual achievement of modern technology to serve mankind, several crucial negative aspects of it and the future promising prospect of modern biotechnology to solve those problems.

Modern Technology change the world drastically.

At present, the accelerating development of modern technology has led to several important achievements.

In agriculture, modern agriculture has increased the productivity of crops significantly. The application of fertilizer, pesticide and better varieties of seeds and modern water irrigation are the main cause of this increase. In modern fish capturing technology, Nicholson (1979) has shown

that in 1979 the productivity of fish capturing was increased four times the productivity in 1930. Without these achievements, the world with current population number will suffer from famine.

In transportation, modern technology has provided mankind with fast massive transportation, automobile, trains, ship vessel, jet airplane, rockets, and space shuttle. It enables people to land on the moon, a milestone that in the past people only ever dreams about. These provide man with vast mobility to move around.

In medicine, modern medical technology prolongs average life age of mankind, cures most contagious diseases that will surely causing death centuries ago, such as tuberculosis, syphilis etc.

In industry, the application of computer as CAD (Computer Aided Design) and CAM (Computer Aided Manufacturing) has led to automation that increases dramatically the productivity.

The advent of civil engineering in construction of tall building, underground city, gives advantage of efficient land use, reducing travel time to the urban residence.

The space technology with its satellites, revolutionize the concept of telecommunication and data communication. It enables television to cover any event in the world and broadcast all over the world. It enables computers to link other computer on the other side of the world, that brings more efficient transactions in trading, banking and support decision maker with information to decide faster and more accurate.

Serious Threat of Modern Technology.

However, there are very serious negative aspects of modern technology that can be thought of as 'holding a demon by the tail'. Those things are the threat of modern nuclear warfare, the exhaustion of unrenewable natural resources and environmental destruction.

Modern technology has devised mankind with methods and tools to do things much more powerful than before. It gives also enough power to destroy the whole civilization and life in this planet earth. The global nuclear war is the obvious threat. In addition to that are the modern biological and chemical warfare that also have massive destroying effect.

The depletion of unrenewable natural resources is the second problem. When it is unsolved, it will cause the collapse of the civilization a little longer than the instant destruction of nuclear warfare. A very clear case is the energy crisis. Our civilization consumes energy abundantly and basically from the fossil fuels of oil and gas. If the consumption of that energy is maintained just constant as to date, the reserve of fossil fuels will be depleted in just a few centuries. Although efforts have been made to substitute fossils energy by nuclear, wind, solar energy, it will give only temporary holding effect. The most feasible energy source is nuclear power which is also unrenewable, that means the uranium as the raw material will deplete finally. Moreover, our modern economic systems are based on economic growth that will encourage more consumption on energy. The

proposed zero growth on our modern economic system sounds good but is unlikely to do so, since it will create recession and further to depression.

The third serious problem of modern technology is the environmental destruction. The uncontrolled deforestation of tropical forest for pulp and paper industry is one example of it. Evidence of ozone big hole in the atmosphere due to ozone layer depletion that is caused by the use of CFC is another example. CFC is commonly used for refrigerator, aerosol propellants, and air conditioner. Alma, PJ (1993) states, 'CFCs had been predicted, in the early 1979s, to be likely to release free chlorine atoms when they reached and then decomposed in the stratosphere. These chlorine atoms were known to be capable of destroying ozone molecules and in the process, releasing the active chlorine atoms again'. Another obvious example of the destruction of the environment is the massive pollution from the spillage of modern industry that is released to the rivers poisoning fishes and its flora and fauna. Also the gas pollutant from the combustion of fossil fuel from the automobile engine is claimed to be responsible for the green house effect causing the global warming of the earth.

In addition to that are the social problems of urbanization, the congestion of the urban area, alienation of individual in big city, unemployment and work dissatisfaction.

Modern Bio Technology – the promising future solution.

The promising benefit of modern biotechnology for the future is to the solution of major mankind problems. Modern biotechnology is the use of plant, animal cells and microbes by applying genetic engineering in the manufacture of goods useful to mankind.

There is intensive biotechnology research in the production of bioenergy.

“When illuminated, the algae *Chlorella pyrenoidosa*, can assemble two water molecules to form a compound known as glycolate. This substance, collected breaking apart the algal cells, is then used as the raw material for the next stage. Glycolate is fed to an immobilized enzyme, glycolic oxidase, obtained from plants. This enzyme catalyses the transformation of glycolate into formate, releasing hydrogen gas and carbon dioxide. Thus the sum total of all three stages has been to separate the hydrogen and oxygen atoms that were originally combined in water molecules. (Prentis 1985)”

The success of biotechnology in providing hydrogen gas economically and on a large scale creates what Prentis (1985) stated as perfect energy, since the raw material is water that covers three-fifth of the globe and the power supply is the sun that will last for million of years and genetically engineered microbes as the manufacture. Moreover, there is no pollution created in the use of hydrogen as fuel, because it forms water, the renewal of the raw material. This will be the ultimate solution of the energy problem.

To the solution of the massive pollution problems, Prentis (1985) proposes two ways: “Firstly, the root causes can be attacked by the

introduction of more biotechnological production methods, which are intrinsically less polluting.

Secondly microbes can be deployed as voracious scavengers, removing all manner of pollutants.”

The other promising prospect of modern biotechnology, not less important than those solutions of energy and pollution problems are the cure of Cancer and Aids and other currently incurable diseases.

Summary.

It can be summarized that modern technology provides mankind with more material and physical comfort, longer life expectancy and theoretically more leisure time, which means man can spend more time for cultural things, education and other things valuable to improve the quality of the soul, previously available only to a certain elite class in the society. On the other hand, there are three crucial negative aspects that are massive destructive modern warfare (global nuclear war), energy crisis and environmental destruction and not less important to that are the social problems.

In conclusion, for the second and third problems that are mentioned above, it seems there is no way other than modern technology to solve it. Mankind has come to a point of no return; the denial to the use of modern technology will just bring the collapse of the civilization as in the case of energy crisis. For the first problems and other negative aspects of social problems, the solution has to be based on the good will of mankind, individually and collectively.

The author is in the position for modern technology as tools to serve mankind. All the negative aspects created by the use of technology have very little to do with technology itself. Mankind is fully responsible; they are in full command and should be in full control in the selection and use of the suitable technology. Moreover any retarding attitude toward technology development will not solve the problem whatsoever and will even create more problems.

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