Contribution of Modern Technology for Human Welfare

Dr.Lalit Singla
Assistant Professor
School of Commerce & Management,
Sri Guru Granth Sahib World University,
Fatehgarh Sahib

Sourish Singla
Research Scholar, Punjabi University
Patiala

Abstract
Many observers see advances in technology as the key means for ensuring continued economic growth, and with it human progress as well. In particular, three modern technologies—biotechnology, information technology (sometimes including robotics and cognitive technologies) and nanotechnology are seen by some researchers as converging and thus bringing about unprecedented benefits for humanity in the coming decades. The aim of this paper is to answer the question: can the on-going rapid advances in these new technologies lead to a better future for human mankind.
Applications of sectors like Aerospace, Automotive, Biotechnology, Computer Engineering, Computer Science, Information Technology, Nano-technology, Nuclear Physics, Robotics, Semiconductors, and Tele-communications can largely effect to meet the future needs in the pace of human progress.At this timewhen the pace of technological change will be so rapid and its impact so deep that human life will be irreversibly transformed.

Introduction

Technology these days recognised to be essential to economic growth, the diffusion of scientific and engineering capabilities throughout the world accelerated. The global spread of technology capabilities has brought with it an unpresented integration of the global economy, exposing new dimensions. Coupled with population pressures & higher standards of living engagements have confronted with unstainable rate of global environment& ecological deterioration that threatens that habitability of the planet. We now find over selves in unique dilemma.
So, it will be essential for us to keep the pressure for increased productivity & high quality of goods & services for the welfare of human mankind. It is essential that we adopt economic policies necessary to develop the pool of capital essential for investment in new plant & equipment, which embody technological changes.
Applications of Technology in sectors like Aerospace, Automotive, Biotechnology, Computer Engineering, Computer Science, Information Technology, Nano-technology, Nuclear Physics, Robotics, Semiconductors, and Tele-communications can hinder to meet the future needs in the pace of human progress. Let's us discuss these applications in detail.

Aerospace

Creative people in all walks of life have recognized the value of this new knowledge and its new technologies and are utilizing them to make life better for everyone. Meeting the challenge of

exploring and using space for the benefit of humanity has expanded knowledge and skills in virtually every field of science and technology.

Technologies developed for specific purposes often can be applied in other areas. These applications are known as indirect benefits, or "spinoffs." For instance, NASA's requirement for small, lightweight, dependable guidance and communications systems for spacecraft brought about electronic miniaturization and a revolution in computer technology. An excellent example of this spinoff is the pocket calculator. Technologies developed through NASA's[1] far-ranging aerospace programs have found applications in thousands of areas-the list extends to catalog length. Collectively, they add up to consequential gains in personal convenience, human welfare, industrial efficiency and economic value. The Technology Utilization Office within the Advanced Projects, Technology and Commercialization Office is involved in making space technology available to private industry. Now every office is charged with the task of informing people and organizations about currently available aerospace technology, and helping them put this information to work. Basically, it tries accomplishing this in two ways: by helping people from industry and educational institutions find available technology that fits their needs; and by identifying and publicizing new technologies developed and making them available to potential users.

One of the major components developed for the Launch Processing System is the Common Data Buffer, which can serve as the interface and communications medium in aerospace computer complexes. It can be used with any computer and for processing in any computer language, making it widely applicable throughout the industry.

Stefan Hawking[2] thinks space exploration will be important to ensuring the survival of humanity. He believe that the long-term future of the human race must be space, and that it represents an important life insurance for our future survival, as it could prevent the disappearance of humanity by colonizing other planets.

Automotive: The **history of automotive transport** is largely one of technological innovation. Advances in technology have allowed people to travel farther, explore more territory, and expand their influence over larger and larger areas. Even in ancient times, new tools such as foot coverings and snowshoes lengthened the distances that could be travelled. As new inventions and discoveries were applied to transport problems, travel time decreased while the ability to move more and larger loads increased. Innovation continues today, and transport researchers are working to find new ways to reduce costs and increase transport efficiency which will overall enhance human welfare.

Biotechnology:A branch of science that utilizes and manipulates microorganisms for the welfare of mankind is **biotechnology**. It uses technique that can modify the products, improve qualities of plants and animals and also products generated from microorganisms. Biotechnology is the applicative part of biology that is multidisciplinary in activity.

Everybody these days are aware of different vaccines, probiotic foods, genetically modified foods, biotechnological vegetables, different enzymes and medicines but very few know the technology associated behind these products. Biotechnology utilizes the technique called g**enetic engineering or recombinant DNA**[3]**technology** where a microorganism is isolated; its genetic material is cut, manipulated, sealed, again inserted in an organism and allowed to grow in

a suitable environment under controlled conditions to get the desired product. It looks easy but is a very tedious job and it takes years for a research to achieve its goal. **Humulin**, the human insulin is a good example of biotechnological product. Earlier insulin was isolated from pigs but now day's insulin is produced by genetic engineering where microorganisms are responsible for the production of insulin. That's why today the rate to insulin demand is equalled the production rate.

Computer Science: Man lives in two worlds – the world of matter and the world of spirit. The scientist indeed is the ruler of the world of matter which is completely under his dominance. But the latter is altogether beyond his sway. The scientific mind seems quite helpless in the world of spirit which is of vital importance for human life, his interrelationship, relationship with nature, spiritual rituals and ways of being which form an essential and important part of his life. Moreover, there are large lacunae in clearly understanding man's relation with God and nature. There are fundamental queries of birth and death, sin and virtue – which science is unable to explain and these form an integral part of human life. These finer mysteries still remain far beyond the reach of human mind and are likely to continue to remain so.

It is true that science encourages forward looking and active temper of mind for the welfare of human mankind. It helps in removing the cobwebs of superstition &ignorance. It provides insight into the complexities of life and outer space, but unsupplemented and uncorrected, it gives an inadequate view of the world. The human mind envisages endless possibilities to unravel the mysteries of this world and beyond with constant support and funding in billions. India also is striding towards becoming an innovative superpower[4] within this century. It sounds extremely wonderful and fascinating. The scientific manpower in India is estimated to be three million, with its nationals leading the world in cutting-edge technology. But in spite of this potential resource the other side is that there are many who lack access to basic life care, education and amenities. For 67 years (1947-2015) we have been celebrating Republic and Independence Day. However, in spite of having the maximum number of medical and dental institutions which provide a large number of medical scientists, India's health system is under consistent burden of infectious diseases. A large section of the society lives in poverty and many die due to hunger, malnutrition, infectious diseases like TB, HIV-AIDS and also due lack of basic care and basic healthcare which is our fundamental right. What to talk of the oral healthcare which is considered far below satisfaction. All these scientific advances, achievements by the scientific mind, are of no worth to these underprivileged. How do we bridge the gap, provide for all, educate and provide for meaningful existence? How do we accomplish this mammoth task? The scientist with all his logic and objective enquiry is not capable of achieving it. That is where the world of spirit enters. For is it not the undying devotion towards God, spiritualism, the undying human spirit that provides for the existence of these marginalized sections? The coordination of the different branches and sub-branches of knowledge and its application to human welfare is the main function of man's life.

It is, therefore, with the temper and approach of science allied to philosophy and with reverence for all that lies beyond that we must face life. The research advancements and benefit of science exists only when it percolates downwards benefitting all. Thus we may develop an integral vision of life which embraces in its wide scope the past and the present with all their heights and depths.

Human welfare should be the ultimate goal of science, because in the end are we not inhabitants of the same world whose actions affect fellow human beings.

Nano-technology: Nanotechnology is helping to considerably improve, even revolutionize, many technology and industry sectors: information technology, energy, environmental science, medicine, homeland security, food safety, and transportation, among many others. After more than 20 years of basic nanoscience research and more than a decade of focused R&D, applications of nanotechnology are delivering in both expected and unexpected ways on nanotechnology's promise to benefit society.

Most benefits of nanotechnology[5] depend on the fact that it is possible to tailor the essential structures of materials at the nanoscale to achieve specific properties, thus greatly extending the well-used toolkits of materials science. Using nanotechnology, materials can effectively be made to be stronger, lighter, more durable, more reactive, more sieve-like, or better electrical conductors, among many other traits. There already exist over 800 everyday commercial products that rely on nanoscale materials and processes. Like Nanoscale additives in polymer composite materials, additives to surface treatments of fabrics, Nanoscale thin films on eyeglasses, computer and camera displays, windows, and other surfaces which are resistant to ultraviolet or infrared light, anti-fog, antimicrobial, scratch-resistant, or electrically conductive.

* Nanotechnology in Electronics & Communication: Nanotechnology is already in use in many computing, communications, and other electronics applications to provide faster, smaller, and more portable systems that can manage and store larger and larger amounts of information which include nanoscale transistors, Magnetic random access memory (MRAM) that encrypted data during a system shutdown or crash, enable resume-play features and gather vehicle accident data.
* Environment remedial Applications:Besides lighter cars and machinery that requires less fuel, and alternative fuel and energy sources, there are many eco-friendly applications for nanotechnology, such as materials that provide clean water from polluted water sources in both large-scale and portable applications, and ones that detect and clean up environmental contaminants.Nanotechnology could help meet the need for affordable, clean drinking water through rapid, low-cost detection of impurities in and filtration and purification of water. For example, researchers have discovered unexpected ultra-smallparticles, which can help remove arsenic or carbon tetrachloride from water.
* Nanotechnology in future transport Applications: In addition to contributing to building and maintaining lighter, smarter, more efficient, and greener vehicles, aircraft, and ships, nanotechnology offers various means to improve the transportation infrastructure.

Applications of bio-nanotechnology are extremely widespread. Bio-nanotechnology is much more commonplace in that it simply provides more tools for the study of biology. Bio-nanotechnology, on the other hand, promises to recreate biological mechanisms and pathways in a form that is useful in other ways.

Nuclear Physics:A **nuclear weapon** is an explosive device that derives its destructive force from nuclear reactions. There are two basic types of nuclear weapons: those that derive the majority of their energy from nuclear fission reactions alone, and those that use fission reactions

to begin nuclear fusion reactions that produce a large amount of the total energy output. Both reactions release vast quantities of energy from relatively small amounts of matter.

Today the mankind is riveted to the question of how to use the tremendous new achievements of science & engineering which have put the energy of the atomic nucleus at the service of mankind that have opened up new prospects for human mankind. Although we cannot shut our eyes to the fact that today, when relations between countries are developing are on the note of sus pious & mistrust, when they have atomic and hydrogen weapons in their armaments and even more new destructing weapons are created by scientists. The danger of war will hand consistently on human mankind.**Atomic energy, also referred to as nuclear energy, is used to generate electricity, and has applications in the fields of agriculture, medicine, research and industry, too.**

However atomic energy can also be used for human welfare. Atomic energy contains highly active radioisotopes, which are various forms of atoms comprised of the same chemical elements. These isotopes share many chemical properties, but have different volumes of relative atomic masses, which make them suitable for different chemical, electrical, engineering and industrial practices. Reactors consisted of a large pile of graphite into which was insulated uranium metal. When enough fuel is filled in the nuclear base it sparks but the graphite protects it from explosion so that the nuclear fire burns peacefully and safely, the nuclear furnace produced a heat which can be compared to the burning of thousands of tons of coal. Atomic energy can be put to various constructive uses.

Small amount of it can be used for a very large amount of heating or electricity in industrial undertakings and factories. Atomic radiation helps chemical action in the process of polymerization which further helps in the radiation processes of raw materials-steel, plastics, rubber etc. Radioisotopes are finding many natural uses. Atomic radiations electrify the air and are used for making so many other things.

Atomic energy can also be applied in the field of agriculture. Atomic radiation can be applied to seeds which can yield many more times to normal one. Atomic energy can also help in the preservation of foodstuffs for a longer time. It can also help the productivity of foodstuffs in regions where agricultural processes cannot be otherwise carried out.

Atomic energy[6] is proving its best use in the field of medical sciences. It is helping the doctors in diagnosing the diseases and in the treatment of the patients. Radio iodine is used in diagnosing all defects in thyroid glands. The new tools and instruments manufactured with the help of atomic energy are making medical science perfect. Radioactivity can also be used for curing brain tumours.

Modern medical science is exploring other uses of the atom and hopes that man king can in due course of time control death and diseases and ensure long life for human beings in the world. It can now supply electricity and power to a country's every part on nominal cost. Industries can make use of the atomic power for expanding their production. With increased production in the field of agriculture and industry, human beings can attain higher standards of living and make their life happier and better.

It is thus seen that atomic energy which can be a source of great happiness to mankind. If it is applied, it must be useful for peaceful purposes for the benefit of Human welfare & not dissipated for destructive purposes.

Semiconductors: Almost all of today's technology involves the use of semiconductors, with the most important aspect being the integrated circuit (IC). Some examples of devices that contain integrated circuits include laptops, scanners, cell-phones, etc. Semiconductors for IC's are mass-produced. To create an ideal semiconducting material, chemical purity is a essential. Any small imperfection can have a drastic effect on how the semiconducting material behaves due to the scale at which the materials are used.

In today's world Semiconductors are the foundation of modern electronics. Semiconducting materials exist in two types - elemental materials and compound materials. The modern understanding of the properties of a semiconductor relies on quantum physics to explain the movement of electrons and holes in a crystal lattice. An increased knowledge about semiconductor materials and fabrication processes has made possible continuing increases in the complexity and speed of microprocessors and memory devices.

Some of the properties of semiconductor materials were observed throughout the mid- 19th and first decades of the 20th century. Development of quantum physics in turn allowed the development of the transistor in 1947 although some pure elements and many compounds display semiconductor properties, silicon, germanium, and compounds of gallium are the most widely used in electronic devices. An integral part of today's new technology is built upon semiconductors, which are made primarily of silicon metal.

Tele-communications:A new mobile generation has appeared approximately every 10 years since the first 1G system, Nordic Mobile Telephone[7], was introduced in 1981. The first 2G system was commercially deployed in 1992, and the first 3G system appeared in 2001. 4G systems fully compliant with IMT Advanced were first standardized in 2012. The development of the 2G (GSM) and 3G (IMT-2000 and UMTS) standards took about 10 years from the official start of the R&D projects, and development of 4G[8] systems began in 2001 or 2002. In April 2008, NASA partnered with Machine-to-Machine Intelligence (M2Mi) Corp to develop 5G[8] communication technology.

5G (**5th generation mobile networks** or **5th generation wireless systems**) denotes the next major phase of mobile telecommunications standards beyond the current 4G/IMT-Advanced standards. 5G has speeds beyond what the current 4G can offer.

The Next Generation Mobile Networks Alliance feels that 5G should be rolled out by 2020 to meet business and consumer demands. In addition to providing simply faster speeds, they predict that 5G networks also will need to meet the needs of new use cases, such as the Internet of Things as well as broadcast-like services and lifeline communication in times of natural disaster.Although updated standards can be regulated by the governing body TRAI, that define capabilities beyond those defined in the current 4G standards are under consideration, those new capabilities are still being grouped under the current 4G standards.

6G[9] uses air fibre, delivered through the air that allows receiving broadband connections similar to radio technology. It is a combination of radio frequencies and standards to deliver service to end users in through their radio distribution and access network. The radio technology is supported by fibre network that transmits high speed internet regardless of your distance from the exchange.6G offers wireless internet services with 10Mbit/s to 300Mbit/s speed. It also offers call packages without physical line.

Conclusion

Extravagant claims for the impact of new technologies are not new. Nuclear energy, it was once argued, would be too cheap to meter.Similarly, when radio and then television first appeared, enthusiasts claimed that these technologies would revolutionise education. Nevertheless, general purpose technologies such as the steam engine and electric power did profoundly alter transport, industry, agriculture, the size and structure of cities, and thus our lives.These and other technologies developed during the first industrial revolution also greatly increased the global consumption of energy, nearly all of it from fossil fuels.

The high-income countries have thus inherited a legacy of energy-intensive industry, transport, climate control of buildings, and even agriculture, and the rest of the world seems bent on following this same path. This high use of fossil fuel energy has led to an increasing number of environmental and resource depletion problems.

The first lesson to draw from our analysis is that much of the effort put into the high tech solutions proposed in our examination of the two important sectors appears to be addressing the wrong problem—at least from a human welfare point of view, if not from a corporate business viewpoint. In this, they have simply followed the lead of the existing technologies in these sectors. For transport, the emphasis has been on vehicular mobility rather than access, for medicine and health, on pursuing cures rather than prevention of illnessand promotion ofhealthy living, and for food and agriculture, on production increases rather than on elimination of hunger. The only exception seems to be the occasional promotion of the new IT as a substitute for travel, particularly through telecommuting and teleconferencing. However, to the extent that telecommuting and teleconferencing have been implemented, they have been unsuccessful in cutting vehicular travel. A second lesson is that the high-tech solutions are often much more expensive than even the existing technologies, let alone simpler solutions that attempt a better balance between the technical and the social. Think of the low costs of non-motorised transport or the adoption of healthier lifestyles. Whythen, are high technology and expensive approaches often used instead of simpler and cheaper ones? Part of the answer is undoubtedly the fact that simple solutions such as using non-motorised travel and exercise in general as a substitute for private vehicular travel would generate much less revenue for corporations, which understandably, are anxious to recoup their outlays as quickly as possible.

Governments, in their pursuit of economic growth, also support car travel over other modes. Similarly, governments see the converging technologies as vital for future economic growth. But another reason is that the public still believes that further progress in these sectors can deliver a better life.A further reason for caution is that many observers are deeply worried about the risks of the new technologies, for a wide range of reasons. We have already discussed the possibility of physical risk to human health from biotechnology and nanotechnology. And, of course, as with all new technologies, the military are stronglyinterested in their possible applications.

There can be many IT-related risks like infrastructure reliability, Security of online data/ information, and possible breakdown of critical IT infrastructure. So the risks from new information technologies are now increasingly recognised. All of us are now aware of the possibility of computer abuse for internet users are almost daily confronted with various computer scams, and threats to privacy online.In the optimistic discussions on a high tech future, it is often implicitly assumed that the technology will function in a world in which human error,

deliberate sabotage, or equipment malfunction never occurs.

Although we have criticised any aspects of the application of modern technology in the preceding sections, it is still the case that completely turning our backs on technology is not an option. Humans have always used technology, and meeting the human needs of billion people in a sustainable manner is inconceivable without its use. Our numbers are far too large for more than a small proportion of us to live in a state of nature, even assuming we would want to do so. Moreover many millions of our expanding human family live in areas at risk from hurricanes, tornadoes, tsunamis and earthquakes. Sophisticated instrumentation technology is needed for monitoring and issuing warnings for these obvious threats to human well-being. Also vital are the measuring equipment, satellites and computers needed to collect data, analyse it and run models to understand global climate and environmental change. Clearly, application of advanced technology is essential in some areas.

Thus human beings have a natural instinct to gain more comfort in their life. They want easiest way for recovery from diseases. They want to travel maximum distance in minimum period. They want to communicate with each other without making barriers by long distance. They want good food, clothes, shelter and all other things which make life luxurious. Thus Science and technological developments are helping human population with many ways.

References

1. http://www.nasa.gov/centers/kennedy/about/history/story/ch17_prt.htm
2. http://www.livescience.com/49952-stephen-hawking-warnings-to-humanity.html
3. http://pharmaknowledgebd.blogspot.in/2011/05/impact-of-biotechnology-in-human.html
4. https://www.quora.com/How-can-India-become-a-superpower-1
5. http://www.nano.gov/you/nanotechnology-benefits
6. http://www.preservearticles.com/2011082111096/596-words-essay-on-peaceful-uses-of-atomic-energy.html
7. https://en.wikipedia.org/wiki/1G
8. https://en.wikipedia.org/wiki/5G
9. https://en.wikipedia.org/wiki/6G_Internet_%28company%29