

TECHNOLOGY: Bane or Boon
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Technology is the buzz word in our times simply because “[t]echnology today affects every single aspect of modern society. In fact, there isn’t an industry . . . that hasn’t been affected by the hi-tech revolution. Whether we are talking about transportation, communication, security, banking or healthcare, they all rely on technology in one way or another.” **The Impact of Technology on Healthcare.** <http://www.aimseducation.edu/blog/the-impact-of-technology-on-healthcare/>

When you try to pin down a simple and clear definition of technology, you discover it is at the same time simple and complex. Take for example, the following:

The application of science, especially to industrial or commercial objectives.
The scientific method and material used to achieve a commercial or industrial objective.
<http://www.thefreedictionary.com.technology>

Technology is properly defined as any application of science to accomplish a function. The science can be leading edge or well established and the function can have high visibility or be significantly more mundane but it is all technology, and its exploitation is the foundation of all competitive advantage. (Wikipedia)

Though not a definition, the following offers a popular understanding of the word by its uses in every day life:

Technology is the fast growing industry as of right now and it has no signs of slowing down anytime soon. In fact everything will be ran by technology in the near future. Technology is around us all the time, lately with computers, smart phones and televisions. So much has changed within this particular field over the years, it has come a long way since the days of the printing press and the first cellular phones. (Technology and Today's World) <http://www.tech50.org/technology-and-todays-world.html>

Technology is not an industry but it drives industry and is critical to progress. It’s present in nearly all areas of life now and will even be more dominant in the future as the following statement asserts.

“Science and technology . . . is the engine that drives economic growth, improves industry competitiveness, accelerates the delivery of government services and enhances the country’s capacity in emerging technologies.” (From the Stands by Domini M. Torrevillas. S&T leads the Way. Philippine Star. Opinion. Tuesday, July 16, 2013)

Lineamenta admits that the benefits of technological research and practical applications continue to fascinate us and we reap the benefits and advantages as a matter of course without realizing how much our lives have become used to them.

We are living at a moment when people still marvel at the wonders resulting from continual advances in scientific and technological research. All of us experience the benefits of this progress in our daily lives, benefits on which we are becoming increasingly dependent. As a result, science and technology are in danger of becoming today’s new idols. In a digitalized and

globalized world, science can easily be considered a new religion, to which we turn with questions concerning truth and meaning, even though we know that the responses provided are only partial and not totally satisfying. (Lineamenta, Chapter 1. No. 6)

Technology is admittedly an extremely broad topic. Last year we had a statio conference on media alone, specifically social media. In this conference we shall turn to some other areas which have been transformed by advances in technology: medicine and health care, food, transportation, business, telecommunications, and education although social media will still be mentioned as one of the most highly utilized technology application.

Medicine and Health Care

Nowhere is the immense impact of technology more apparent and widespread than in the field of medicine and healthcare. In fact, technological breakthroughs are revolutionizing the way healthcare is being delivered. Three areas are worth mentioning that advances in technology have made possible.

Today, HI-TECH IMAGING allows doctors to view internal body structures in amazing detail, while, SURGERY relies heavily on technologies such as lasers, robots, and computers. ARTIFICIAL DEVICES are commonly used either to replace diseased body parts completely, or to provide assistance to failing organs. <http://www.factmonster.com/dk/science/encyclopedia/medical-technology.html>

We are familiar with hi-tech imaging procedures. Many of our own Sisters and relatives have gone through MRI, CTscan, ultrasound, and other diagnostic tools which have become almost indispensable in medical practice. We may not understand how these tools work but we place our faith in them, we trust the results although we may sometimes wonder if there is no other maybe less expensive way to arrive at the diagnosis.

Who will dare argue with this statement:

It is almost inconceivable to think about providing health care in today's world without medical devices, machinery, tests, computers, prosthetics, or drugs. ... Examples of medical technology include medical and surgical procedures (angioplasty, joint replacements, organ transplants), diagnostic tests (laboratory tests, biopsies, imaging), drugs (biologic agents, pharmaceuticals, vaccines), medical devices (implantable defibrillators, stents), prosthetics (artificial body parts), and new support systems (electronic medical records, e-prescribing, and telemedicine). <http://www.ncbi.nlm.nih.gov/books/NBK44737/>

However, there is a minus to this: "Technology continues to transform the medical care system and to improve length and quality of life—but at substantial cost." (Ibid)

Surgery

The impact of technology has been tremendous in the field of surgery, as the following statements of a surgeon attest.

Technology has become a major driver of the future direction of healthcare and surgery. Likewise, the speed of change has accelerated beyond comprehension, with a number of revolutions occurring during a surgeon's career. Being an agent of change or rapidly adapting to change has become the hallmark of the gifted surgeon. The fundamental challenges to a future surgeon are addressed from a technological viewpoint, with emphasis on the impact upon healthcare. (Advanced Technologies and the Future of Medicine and Surgery.)
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2628030/>

Although this is rather lengthy, it gives us a better idea of how medicine and surgery has evolved with advances in technology.

Everything occurs in cycles: revolution, change, adaptation to change, acceptance of the new standard, codifying the new establishment, resistance to further change, revolution ... and the cycle begins again. In healthcare and surgery, this cycle had been occurring about every 100 years, but recently there has been a perceptible acceleration of this cycle. The first revolution for surgery came during the Industrial Age in the mid 1800's with the simultaneous introduction of anesthesia, asepsis, pathology, new instrumentation, and so on. Nearly a hundred years later, in the mid 20th Century as the Information Age was about to begin, surgery was advancing with antibiotics, intravenous fluid and hyperalimentation, radical surgery resections and chemotherapy to name but a few. By the 1990s, laparoscopic (or minimally invasive) surgery emerged and became the standard for many procedures. Information Age technologies, such as video cameras and monitors, continued the evolution. But technology is accelerating faster than ever, and we are on the threshold of yet another revolution. This is referred to as the BioIntelligence Age, an age of multidisciplinary medicine, which can achieve much more than a single researcher or clinician. The complexities of nature are yielding to inter-disciplinary teams performing multi-disciplinary research - genomics as a combination of biology and information sciences or robotics as a combination for physical (engineering) and information sciences. Much as previous revolutions, this current transformation is occurring because many different technologies are converging to fundamentally change surgery. (ibid)

Not only one technology but many different technologies come into play in the "veritable explosion of new discoveries" that are changing surgery.

Much as previous revolutions, this current transformation is occurring because many different technologies are converging to fundamentally change surgery. There is a veritable explosion of new discoveries, such as genomics, micro-electromechanical systems (MEMS), robotics, intelligent systems, molecular biology, etc. The entire healthcare environment and culture are changing at an unprecedented rate of innovation that challenges the practicing physician every day. The change is occurring because of "disruptive technologies", which seemingly completely reverse the fundamental approaches overnight that have been standard for decades. (ibid)

Another area in which change is rapidly taking place is the replacement of organs grown from a person's own stem cells through tissue engineering.

Tissue engineering artificial organs has progressed to a level where a small number of organs are being synthetically grown. Atala et al. now have a 5 year follow up of synthetically grown urinary bladders from the patient's own stem cells that have been implanted and are functioning

normally. These and other approaches by different researchers point to a time in the near future when it will be possible to grow a new organ from a patient's own stem cells. If this becomes the case, then it is theoretically possible that for nearly every disease, the surgeon will simply remove the patient's diseased organ and replace it with a new one (grown from the patient's own stem cells), without the fear of rejection. (Ibid)

The use of stem cell technology though quietly done in the Philippines for some time has erupted into controversy due to some unlicensed practitioners both from the country and abroad. Allegedly, stem cell procedures have been performed not in hospitals but in clinics and hotel rooms. Stem cells used have been from the patient or from animals. A few deaths have been attributed to the unlicensed practice of stem cell technology. That stem cell practice has attracted so many clients just shows that there are many people who are desperate enough to pay a hefty sum to acquire well-being and health. Due to the demand, stem cell practice will continue to advance in this country even before the regulatory guidelines are issued.

Great and sometimes beyond imagination is the promise of technology as it “provides an increasing ability to monitor, prevent, diagnose, control, and cure a growing number of health conditions and to improve quality and length of life.” (Ibid)

But there are questions to ponder: how much innovation and improvement in new and existing technologies is possible when resources are constrained and health care expenditures are rising to unacceptable levels? What about the opportunity costs of using one technology versus another (or neither)? Will target populations be appropriately and equitably served? (Ibid) Will these technologies be available and serve only those who can afford them? On the one hand, the wealthy can fly to the US or to Singapore for the latest procedure to arrest cancer, and on the other hand are the many who can hardly afford chemotherapy.

MORAL AND ETHICAL CHALLENGES

Moral and ethical questions will inevitably be raised about these new technologies. For instance, success with nanotechnology will be forthcoming rather soon, with a significant amount of speculation on the role of "nano-machines" - tiny systems that are injected into the blood stream or other areas of the body, for diagnostic or therapeutic purposes. Will the doctor use this at the instance of the patient even when their long term consequences have not been researched? A new dimension will likely be soon available - femtosecond lasers to operate within the cell and even upon the nucleus and DNA. (Ibid) This presents a dilemma:

Although it seems reasonable to remove a gene that leads to a congenital defect, should surgeons be tinkering with genes directly, and leading to the purposeful genetic design of children for characteristics such as eye or hair color? Or perhaps provide genetic material, such as the sequence which allows the pit viper snake to use infra-red vision to see in the dark, to have characteristics that humans do not naturally have? (Ibid)

With smart prostheses and artificial organs, it may be possible to extend life beyond the average life span for humans - to 150 or 200 years. A question that comes up is, “What would the consequences to society be of such a prolonged lifespan, and will a person retire at age 65 with 90 to 100 years of "retirement?” (Ibid)

The results of the research in today's laboratories are providing potential to not only change an individual or even society, but what it means to be human.

If 90% of our body parts are replaced with artificial organs or prostheses, will we still be human - is it the flesh and blood which we were born with to determine whether we are "human"? While these ethical questions have previously been mere speculations of fantasy, the scientific underpinnings are being created in the laboratory today, and the students we are training today will have to answer the above questions- and more. How can we prepare for such a future challenge? (Ibid)

The surgeons of the future will not only hold the lives of their individual patients in their hands, but may be responsible for the future of what it means to be human. (Ibid)

The good news from medical research providing answers to such diseases as AIDS also brings on some bad news, not just in terms of unnecessary expenditures but in the very boon of longer life expectancy.

The same technology that offers hope for ever-increasing life expectancy is also leading to increased demands on the health care system from a growing population of senior citizens. Ethicists and health professionals alike are now raising questions about when and from whom treatments should be withheld, as competition for the scarce medical resources of the health care system grows beyond the system's capacity to provide care for everyone. Already, some forms of rationing have been implemented, and more rationing of health care resources may be inevitable. (Ibid)

This is now the issue facing religious congregations of both men and women whose members live beyond 90 years with support of expensive health care and medical procedures. The consequences of graying population is already upon us religious as it is the serious problem of a number of developed countries in Europe.

Improving the quality of life, increasing life expectancy are definitely benefits of advanced medical technology. There are also areas where technology intrudes into life itself as in *in vitro* fertilization and the modification of DNA of the unborn mentioned above or even the termination of an unborn diagnosed with genetic defects. A document on recent developments in biomedical technology was issued by the Vatican in 2008, the first in 20 years. The document reinforced the opposition of the church to *in vitro* fertilization, human cloning, genetic testing on embryos before implantation, and embryonic stem cell research. The document titled "The Dignity of the Person" asserts that "these techniques violate the principles that every human life - even an embryo - is sacred, and that babies should be conceived only through intercourse by married couples." Aware that the document would probably "be accused of containing too many bans" the church felt it its duty "to give voice to those who have no voice." ■ **Vatican unveils document on bioethical issues.** New York Times / December 13, 2008.

FOOD

Health and wellbeing are the areas proper to medicine, and so food, the most necessary component in all these is logically the next subject affected by technology.

Food technology (Food tech) is the application of food science (science and engineering) to the selection, packaging, distribution, preservation, processing of food. www.ask.com/question/what-is-the-definition-of-food-technology

Developments in food technology has made production of foods more efficient. For instance, oil saving technologies are now available on different forms. Production methods and methodology have also become increasingly sophisticated. Among the developments from food technology are some products we use daily: instant milk powder, decaffeinated coffee and tea made possible by freeze drying, an important process imported from the pharmaceutical industry. (Wikipedia, Food Technology)

Nestle, one of the world's leading producers of food whose products we see on our tables everyday, recognizes the crucial role of technology in its continuing growth.

Technologies are a vital part of our R&D. We have engineers working in R&D in a variety of fields – from packaging and equipment, to food processing technologies and manufacturing new beverage systems such as *Nespresso*, *Nescafé Dolce Gusto*, *Special. T* and *BabyNes*.

Alongside engineers, our food scientists develop processes and technologies that enable the development of safe, nutritious foods and beverages while keeping us on the cusp of new developments in food science and technology.

Among the developments from Nestlé are these examples.

Fermentation and probiotics: The Nestlé Research Centre was one of the first to look at the molecular interaction of probiotics with intestinal cells. We have sequenced several probiotic genomes, so that we can better understand their characteristics and mechanisms of action.

- Healthier fats
- Foam booster technology: This produces the creamy head for *Nescafé Cappuccino*, with less fat, and which is much denser and longer-lasting than regular foam.
- Malt extraction: We have developed a new process for malt extraction for *Milo* that meant less sucrose and more complex carbohydrates in the product. It was launched in Malaysia in 2006, and in 2007 it was rolled out across Asia. (Food science and technology. <http://www.nestle.com/randd/technologies><http://www.nestle.com/randd/technologies>)
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Technology in the food industry is driving the aggressive and forward looking plans of companies.

We are at the beginning of the most radical transformation of our food industry since the Green Revolution. Until now, food innovation — including agricultural production, processing, distribution and retail — happened in the laboratories and strategy shops of a few select multinationals. These approaches to innovation have been proprietary, consolidated and designed to maximize shareholder interests. But as the Internet democratizes virtually every industry, like healthcare, media and education, it's becoming increasingly clear that a more holistic future is possible. Leveraging information, technology and multidisciplinary design, we can begin to level the playing field between industrial and sustainable food. We can create a future that's decentralized, collaborative and designed to maximize the interests of producers, eaters and the environment. (When It Comes To Food, Technology Is Changing The Game.) <http://www.forbes.com/sites/daniellegould/2013/07/03/when-it-comes-to-food-technology-is-changing-the-game/>

Technology alone will not feed the world. There is a further misconception that the industry must choose between technological or traditional agriculture solutions. But technology can be used to optimize traditional solutions, by helping to streamline and better manage operations, more efficiently utilize resources and improve communications. (Ibid)

Leading the advances in technologies are schools such as Georgia Tech.

FPTD develops next-generation technologies for processing efficiency and operational enhancement in the food processing and general manufacturing industries. A unique research unit of the Georgia Tech Research Institute, FPTD works collaboratively with university and industry partners on projects involving advanced robotics and automation, imaging and sensing, environmental, energy, and worker and food safety technologies. Our goal is to transition technologies from concept to practice, as quickly and economically as possible (ABOUT FPTD at Georgia Tech). <http://foodtech.gatech.edu/>

Schools of Technology offer programs in Culinary Arts technology, showing that food in its different stages of preparation is now considered technology and is a highly profitable profession.

Transportation

Technology has tremendously transformed all three forms of transportation -- land, sea and air.

From human power, to animal power, land transport has leaped to engines that run by fossil fuel. Cars now are no longer just utility vehicles moving materials and people. They are designed for efficiency and beauty, for utility, luxury and for status. They are not just for transport but also for showing off. However, with mass production technology, cars have become affordable and for some people are indispensable for work not just as a support of a lifestyle. With the rising cost of fuel, buyers keep a sharp eye on the vehicle's fuel efficiency, often choosing a more expensive model for that reason. Cars being accessible and affordable, people drive a short distance to run an errand rather than walk. Computer components are now imbedded into the operating system of cars such that a breakdown will require not the mechanic at the corner but a trained technician. New generation cars are now hybrid such as the Toyota Camry and research is in the direction of cars run by batteries that can be electrically recharged.

Trains are the other mode of land transportation that have been transformed by technology. For us in the Philippines, the LRT or MRT is our taste of a mass transit train. But in Europe, China and Japan, fast and high speed trains are the technological showcases for mass land transport. The bullet trains of Japan are now overtaken by the super hi-speed trains of China. The technology that developed high speed trains employs *maglev* or magnetic levitation. High speed trains are now efficient and safe.

Today there are high speed trains that use steel wheels on steel tracks that can travel at speeds over 200 mph. Minimal stopping for traffic, long curves, and aerodynamic, light trains also allow today's high speed trains to travel even faster. In addition, new technologies being implemented in train signaling systems can enable high speed trains to safely minimize time between trains at stations, thereby allowing travel on them to be even more efficient

High speed trains are also considered more energy efficient or equivalent to other modes of transit per passenger mile. In terms of possible passenger capacity, high speed trains can also reduce the amount of land used per passenger when compared to cars on roads. In addition, train stations are normally smaller than airports and can therefore be located within major cities and spaced closer together, allowing for more convenient travel. (High Speed Trains. High Speed Train Systems Operate Worldwide. <http://geography.about.com/od/urbaneconomicgeography/a/highspeedtrains.htm>

Recent accidents involving trains seem to indicate that technology cannot prevent human error.

Air transport: Tech for the skies

Human ambition to fly is the stuff mythologies are made of. In modern times, ever since the Wright brothers took to the skies, there has been no looking back in advancements in aviation technology. Air travel is no longer confined to being the privilege of the elite that it once was. According to industry estimates, air traffic has doubled every 15 years since 1970. Having recovered from the economic recession, the aviation industry is bullish going ahead, fuelled by dynamic growth in emerging markets, increasing urbanisation driving wealth and traffic growth.... <http://www.geospatialworld.net/Paper/Cover-Stories/ArticleView.aspx?aid=24846>

The airplanes we fly in are complex machines requiring advanced technological solutions working in synchronicity to help maximize operational availability, safety, and reliability. Manufacturers must meet stringent performance, reliability and maintainability requirements while also delivering the highest possible value to customers. <http://www.pall.com/main/aerospace-defense-marine/commercial-aircraft-54896>.

Air transportation is vital to world economy and must constantly keep up with demands of the world market. "The need for large-scale air transportation has been central to **commercial aircraft** manufacturing. As one of the world's most vital industries, airlines are key to many aspects of the world economy, from international business and tourism to routine movement of people and goods ranging from massive machinery to agricultural products." <http://global.britannica.com/EBchecked/topic/127877/commercial-aircraft>

The race in airspace travel now is in the production of planes that meet all the requirements of safety and reliability as well as financial return-of-investment considerations. Boeing, the biggest aircraft manufacturer advertises its latest product:

The Boeing 787-9 Dreamliner is a super-efficient aircraft, bigger than the 787-8. Both airplanes are very competent having new passenger-pleasing traits. Using 20 percent less fuel than any other aircrafts of their size, these models will give you the economics of large jet transports to the middle of the market. <http://www.topspeed.com/aviation/commercial-aircraft/ke3548.html#ixzz2cDGphVQH>

Airbus, the European manufacturer advertises its Airbus A380-800 which can accommodate 853 passengers. <http://planes.findthebest.com/d/t/Commercial>. The target market is the tourism industry which is the biggest customer for commercial aircraft.

Other considerations of the airline industry are taken up by geospatial technology, the term specific to aeronautical matters. It is one of the key enabling technologies being used in overall planning, deployment, delivery, maintenance, and management of the aviation infrastructure to ensure smooth and safe flight movements amidst growing air traffic. <http://www.pall.com/main/aerospace-defense-marine/commercial-aircraft-54896> Among the technologies used by cars for determining directions to destinations is GIS which is now migrating to air travel to manage and update the aeronautical charts that are used by the pilots and air traffic control staff. Another function of GIS is the old problem of bird strikes. “Aircrafts have battled bird strikes for decades. Airports are turning to technology to prevent the collisions between birds and planes.” (Ibid)

Even more sophisticated are the technologies for military aircraft. To mention only one example, the drone uses the technology of unmanned aircraft to carry out sensitive “missions” with accuracy and without losing the pilot.

Business

Obviously technology affects almost every aspect of our lives. “Just look around you and you'll see how wired we are. Thanks to the Internet, virtually anything you desire can be delivered to your door in a matter of days. Personal information is more accessible over the Internet as well -- you can look up everything from a long-lost cousin to the registered sex offenders in your neighborhood. You can even trade stocks or file taxes online.” (How has technology changed the way we conduct business?) <http://money.howstuffworks.com/technology-changed-business.htm>

If our personal lives have been changed by technology, the business world has revolutionized itself beyond recognition in the last few decades because of advances in communication and information technology.

How has the face and the pace of business changed ? Here are some major areas.

“As communication and information travels faster and faster, the world seems smaller and smaller, and this has large implications for the way we conduct business. Storing important files in a computer rather than in drawers, for instance, has made information easily accessible. Using e-mail allows businesses to communicate and send these files quickly to remote locations outside of an office.” (Ibid)

Businesses have been at the forefront of technology for ages. Whatever can speed production will draw in more business. As computers emerged in the 20th century, they promised a new age of information technology. But in order to reap the benefits, businesses needed to adapt and change their infrastructure [source: McKenney]. For example, American Airlines started using a computerized flight booking system, and Bank of America took on an automated check-processing system. (Ibid)

As information travels faster and faster and more reliably, barriers of distance disappear, and businesses are realizing how easy it is to outsource jobs overseas. **Outsourcing** refers to the practice of hiring employees who work outside the company or remotely -- and even halfway across the world. Companies can outsource duties such as computer programming and

telephone customer service. ... Outsourcing is a controversial practice, and many believe that U.S. companies who take part are hurting the job market in their own country. Nonetheless, from a business perspective, it seems like the wisest route, saving companies between 30 and 70 percent [source: [Otterman](#)]. (Ibid)

Another technology that's starting to revolutionize business is actually not very new -- it's just cheaper these days. **Radio frequency identification (RFID)** technology is infiltrating and changing business significantly in a few ways. Microchips that store information (such as a number equivalent of a barcode and even an up-to-date history of the chip's travels) can be attached to product, and this helps companies keep track of their inventory.(Ibid)

The [Internet](#) enables airlines to provide [online flight booking](#), banks to offer online account management and will pay and allows any company to sell any product online. In general, the Internet has proven to be an inexpensive way to reach more customers. Nowadays, if you can't find a business online, or if it has an outdated, ugly Web site, it looks downright unprofessional.(Ibid)

Many businesses have succeeded in using the Internet as their primary, or sometimes only, medium of transaction.

One of the biggest ways the Internet has changed business is through targeted [advertising](#). (Ibid)

These are just a few of the ways that technology has changed the face and pace of business. The umbrella, overarching technology for all these is telecommunication.

Telecommunication

Telecommunication is “the science and technology of sending and receiving information such as sound, visual images, or computer data over long distances through the use of electrical, radio, or light signals, using electronic devices to encode the information as signals and to decode the signals as information. The American Heritage® Science Dictionary Copyright © 2005 by Houghton Mifflin Company. Published by Houghton Mifflin Company. All rights reserved. <http://www.thefreedictionary.com/telecommunication>

More simply put, telecommunication is communication at a distance by technological means, particularly through electrical signals or electromagnetic waves.
<http://en.wikipedia.org/wiki/Telecommunication>

Telecommunication has a significant social, cultural and economic impact on modern society. In 2008, estimates placed the telecommunication industry's revenue at \$4.7 trillion or just under 3 percent of the [gross world product](#). (Ibid)

The impact of telecommunication is business and the economy can only be called tremendous. To cite a few examples:

On the microeconomic scale, companies have used telecommunications to help build global business empires. This is self-evident in the case of online retailer [Amazon.com](#) but, according to

academic Edward Lenert, even the conventional retailer Wal-Mart has benefited from better telecommunication infrastructure compared to its competitors. (Ibid)

Even relatively poor communities have been noted to use telecommunication to their advantage. In Bangladesh's Narshingdi district, isolated villagers use cellular phones to speak directly to wholesalers and arrange a better price for their goods. In Côte d'Ivoire, coffee growers share mobile phones to follow hourly variations in coffee prices and sell at the best price. (Ibid)

On the macroeconomic scale, Lars-Hendrik Röller and Leonard Waverman suggested a causal link between good telecommunication infrastructure and economic growth. (Ibid)

The minus effect of the widespread utilization of telecommunication mainly through the Internet has produced what is known as the "digital divide."

A 2003 survey by the International Telecommunication Union (ITU) revealed that roughly a third of countries have fewer than one mobile subscription for every 20 people and one-third of countries have fewer than one land-line telephone subscription for every 20 people. In terms of Internet access, roughly half of all countries have fewer than one out of 20 people with Internet access. (Ibid)

This data may be 10 years ago but the digital divide is cause of concern not only by people themselves who feel left behind by technological progress but by the service providers who want to extend their network to every corner and country in the world.

Social relations have been greatly affected by social networking application such as the now ubiquitous Facebook and Twitter among others. "These allow users to communicate with each other as well as post photographs, events and profiles for others to see. The profiles can list a person's age, interests, sexual preference and relationship status. In this way, these sites can play important role in everything from organising social engagements to courtship" (Ibid) A lot of people today rush to the Facebook to publicize their experiences or to share/ventilate their opinions.

Mobile phones or cellular phones have had a significant impact on telephone networks. Mobile phone subscriptions now outnumber fixed-line subscriptions in many markets. Cell phones sending short message service (SMS) which we call text messages have a significant impact on social relations, on business and on ordinary everyday life and now are able to access the Internet without using a computer.

In cultural terms, telecommunication has increased the public's ability to access music and film. With television, people can watch films they have not seen before in their own home without having to travel to the video store or cinema. With radio and the Internet, people can listen to music they have not heard before without having to travel to the music store. . . . Telecommunication has also transformed the way people receive their news. (Ibid)

We cannot talk of telecommunications without mentioning computers and the Internet.

The Internet is a global network connecting millions of computers. More than 100 countries are linked into exchanges of data, news and opinions. According to Internet World Stats, as of December 31, 2011 there was an estimated 2,267,233,742 Internet users worldwide. This represents 32.7% of the world's population. <http://www.webopedia.com/TERM/I/Internet.html>

Unlike online services, which are centrally controlled, the Internet is decentralized by design. Each Internet computer, called a host, is independent. Its operators can choose which Internet services to use and which local services to make available to the global Internet community. Remarkably, this anarchy by design works exceedingly well (Ibid)

No one actually owns the Internet, and no single person or organization controls the Internet in its entirety. The Internet is more of a concept than an actual tangible entity, and it relies on a physical infrastructure that connects networks to other networks. (Ibid)

No one owns the Internet but sometimes one wonders if the Internet actually “owns” us. Just imagine how your life will be without the Internet. Some people actually have to get “de-toxified” from digital, burnout to be weaned from addiction or habituation to the Internet. “We’re realizing that at the end of the day, it (technology) doesn’t nourish us.” (Help at hand for those wanting to detox from technology.) <http://www.japantoday.com/category/lifestyle/view/help-at-hand-for-those-wanting-to-detox-from-technology>

Yet it cannot be denied that technology specially the Internet are there and they are a useful part of our lives, our relations, our work, even this conference. We cannot but agree with the following statement.

The great economic and social development of the past century, with their bright spots and serious shadows, can also be attributed in large part to the continued development of technology and more recently to advances in information technologies and especially their applications in the economy and most significantly in finance. (TOWARDS REFORMING THE INTERNATIONAL FINANCIAL AND MONETARY SYSTEMS IN THE CONTEXT OF GLOBAL PUBLIC AUTHORITY) <http://themoynihansletters.com/from-the-desk-of/2011-letter-38-vatican-document-on-the-world-economy>

Critique

Technology is a response to God’s mandate, “Be fruitful and multiply, and fill the earth and subdue it and have dominion over ... every living thing that moves upon the earth.” (Genesis 1: 28b. Holy Bible. NRSV, Catholic ed., St. Paul, 2006) From the little of technology utilization we have seen, is it facetious to say that technology has subdued us, and dominates more aspects of our lives than we realize. Pope Benedict XVI coined a term for the dominant power that technologies are asserting. He calls it “technocracy,” “making technology absolute, preventing people from “recognizing anything that cannot be explained in terms of matter alone and minimizing the value of the choices made by the concrete human individual who works in the economic-financial system by reducing them to mere technical variables.” Problems to be tackled are exclusively of a technical nature. (Towards reforming...(Ibid)

In his encyclical *Caritas in Veritate*, Pope Benedict XVI explains the place of technology in development and in life and human labor and offers at the same time offers a critique.

The challenge of development today is closely linked to *technological progress*, with its astounding applications in the field of biology. Technology — it is worth emphasizing — is a profoundly human reality, linked to the autonomy and freedom of man. In technology we express and confirm the hegemony of the spirit over matter. “The human spirit, ‘increasingly free of its bondage to creatures, can be more easily drawn to the worship and contemplation of the Creator.” (Caritas in Veritate, 69)

Technology enables us to exercise dominion over matter, to reduce risks, to save labour, to improve our conditions of life. It touches the heart of the vocation of human labour: in technology, seen as the product of his genius, man recognizes himself and forges his own humanity.... It reveals man and his aspirations towards development. (Ibid)

A product of human creativity, “technology can be understood as a manifestation of absolute freedom, the freedom that seeks to prescind from the limits inherent in things.” It then becomes self-sufficient specially when it concentrates on the “how” questions and not enough on the “why” questions. (Ibid)

There’s danger that through globalization, technology can replace ideologies and itself become an ideological power and “we would all know, evaluate and make decisions about our life situations from within a technocratic cultural perspective to which we would belong structurally, without ever being able to discover a meaning that is not of our own making.” In fact, the ‘technical’ worldview that follows from this vision is now so dominant that truth has come to be seen as coinciding with the possible.”(Ibid)

Technology is highly attractive because it draws us out of our physical limitations and broadens our horizon. *But human freedom is authentic only when it responds to the fascination of technology with decisions that are the fruit of moral responsibility.* Hence the pressing need for formation in an ethically responsible use of technology.

Moving beyond the fascination that technology exerts, we must reappropriate the true meaning of freedom, which is not an intoxication with total autonomy, but a response to the call of being, beginning with our own personal being.(Ibid)

The way a technical mindset works can be seen today in certain technological applications in the fields of development and peace. “Often the development of peoples is considered a matter of financial engineering, the freeing up of markets, the removal of tariffs, investment in production, and institutional reforms — in other words, a purely technical matter.” (Ibid)

Progress through development requires both professional competence and moral consistency. “ When technology is allowed to take over, the result is confusion between ends and means, such that the sole criterion for action in business is thought to be the maximization of profit, in politics the consolidation of power, and in science the findings of research.” The flow of technological know-how increases, “ but it is those in possession of it who benefit, while the situation on the ground

for the peoples who live in its shadow remains unchanged: for them there is little chance of emancipation.” (Ibid, 71)

Moving on to the increasingly pervasive presence of the *means of social communications*, “It is almost impossible today to imagine the life of the human family without them. For better or for worse, they are so integral a part of life today that it seems quite absurd to maintain that they are neutral — and hence unaffected by any moral considerations concerning people.” But they are actually subordinate to economic interests intent on dominating the market and attempt impose cultural models and values that serve ideological and political agendas. (Ibid, 73)

It is in the field of *bioethics* that the cultural struggle between the supremacy of technology and human moral responsibility most crucial. “In this most delicate and critical area, the fundamental question asserts itself force-fully: is man the product of his own labours or does he depend on God? “(Ibid, 74)

Pope Benedict declares: We need to affirm today that *the social question has become a radically anthropological question*, in the sense that “it concerns not just how life is conceived but also how it is manipulated, as bio-technology places it increasingly under man's control.” *In vitro* fertilization, embryo research, the possibility of manufacturing clones and human hybrids: all this is now emerging and being promoted in today's highly disillusioned culture, which believes it has mastered every mystery, because the origin of life is now within our grasp. Here we see the clearest expression of technology's supremacy. (Ibid, 74)

In the battle for meaning and value of life itself, what are our weapons? We can counteract with “truth-filled love which is not produced by us, but given to us.” In these difficult times, “we must recognize what is happening but we must above all else turn to God's love.” Our arsenal is composed of attention to the spiritual life, trust in God, spiritual fellowship in Christ, reliance upon God's providence, mercy, love and forgiveness, self-denial, acceptance of others, justice and peace. (Ibid, 74) To the technological mindset these instruments are not even in the vocabulary, but to us whose faith in God is our strength and our bulwark, these constitute our counter-offensive.

Education in Faith

Placing education at the end of this long conference does not in any way mean a gauge of its importance. On the contrary, education, specifically formation, is the channel for the development of our weapons in the strength of our faith in God.

Schools including our Benedictine schools are pushing for greater utilization of technology in its various applications. A school must have computers that access the Internet, LCD projectors in the classrooms, laptops, tablets, materials for computer-aided instruction, programs for our operation systems – finance and business, registration, library, etc. Upgrading of what we already have is a constant pressure on our finances but we are aware that unless we

remain in the flow, if we lag behind, our school will lose in the quest for excellence which is our strength and our attraction. We are not immune to falling into the trap of technocracy, specially with the implementation of the Kto12 system and the thrust for science and math in the curriculum supposedly for progress of our country.

Yet it is precisely in schools and through education that awareness of technocracy and the technical mindset can be developed and its dominance minimized because it can neither be ignored nor totally defeated. Precisely our Catholic schools, and our Benedictine schools are challenged to consistently cultivate awareness of the benefits and ethical use of technology, and disadvantages of dependency on technological solutions to our problems. Our students are already engulfed by fascination with social media and the values they are exposed to are often in conflict with the Gospel and Benedictine values that we strive to implement.

But what Pope Benedict says is true. There is “the pressing need for formation in an ethically responsible use of technology.” (Caritas, 69) This formation comes with a set of values founded on faith and expressed and articulated in ideas, attitudes, behavior – in a life centered in Christ and loyal to his values. It cannot be overemphasized that precisely in the present move to delete God, the center of our formation and faith programs must be Christ.

Education in faith then is our big challenge as Catholic Benedictine schools. Let each school work out a program that will form our students to discern the right and beneficial use of technology and be emancipated from its dominance and experience freedom. **That in all things God may be glorified!**

