Nanotechnology based Innovations and Human Life Comfortability –Are we Marching towards Immortality?

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ABSTRACT

Nanotechnology deals with researching on materials of size one to one hundred nanometers with comparative different physical properties with respect to same materials at higher dimensions. Nanotechnology is recently considered as general-purpose technology essential for solving problems optimally related to both basic needs and advanced wants. Being anticipated as universal technology of21st century, nanotechnology is on the verge of solving many long-time waiting problems related to human prosperity. It is predicted that nanotechnology may have its largest impact on the medical industry compared to other industries. Patients may drink medicine containing nanorobots programmed to kill and reconstruct the molecular structure of cancer cells and viruses. It is also predicted that nanorobots could slow or even reverse the aging process, and life expectancy of human beings could increase significantly. Through suitable programming, nanorobots are expected to perform delicate surgeries which can be thousand times more precise than expert surgeons. Nanorobots can also change the physical structure and appearance of human beings through programmed cosmetic surgery. The advancements in medical and pharmaceutical applications of nanotechnology will be expected to improve the drug delivery and organ regenerations prospects. The paper anticipates and discusses the possibilities how the health science progress is driven by nanotechnology-based innovations leading to predicted and most desired immortality of living beings in this world and reaching the expected status – the ultimate state in human life comfortability.

Keywords: Nanotechnology based Innovations, Ultimate Human Life Comfortability, Immortality, Health science applications of nanotechnology, Universal Super Intelligence (USI) System, Technology based human immortality.

1. INTRODUCTION :

Technology is an applied science used to develop materials, products, processes, and systems which can be used to improve the quality of life of human beings. Technology can be utilized both for solving basic problems of mankind and advanced requirements for their comfortability. Technology provides an opportunity to improve the quality of facilities like communication, transportation, entertainment, and any other problem which need a comfortable and innovative solution [1]. Basically, technology is used to solve problems related to the matter, energy, space or time and manipulate them as per individual and society requirements. Technology is used to simplify, to make easy and effortless systems at comparatively less cost and time saving purpose. Technology is dynamic and based on human requirement is changing and growing. The saga of growth of technology provided many gifts to the society in terms of providing the comfortable lifestyle to the human beings in the society. The developmental stages like industrial age, information age, e-business age, and present artificial intelligence age. Changes in technology due to the many contributions and efforts of scientist and engineers resulted in ubiquitous communication and business opportunities and making human life

optimally comfortable reaching to ideal comfortability level [2-11]. Table 1 highlights the basic and advanced expectations of a human being and the level of achievements using presently available technologies.

Table 1 : Basic and advanced expectations of human beings and their present status

S. No.	Problem	Category	Present status of technology support	Anticipated technology to solve and take to desired level
1	Food	Basic	Medium	ICCT & Nanotechnology
2	Drinking water	Basic	Medium	Nanotechnology
3	Energy	Basic	Medium	Nanotechnology
4	Travel	Advanced	Medium	ICCT & NT
5	Shelter	Basic	Medium	NT
6	Ubiquitous Communication	Advanced	Final stage	ICCT & NT
6	Entertainment	Advanced	Final stage	ICCT
7	Health	Basic	Medium stage	ICCT & NT
8	Space travel	Advanced	Lower stage	NT &GT
9	Aging	Advanced	Lower stage	NT & BT
10	Immortality	Advanced	Lower stage	NT & BT

While examining table 1, it is observed that many of the basic requirements and comfortable life requirements based on the desire of human beings are yet to reach their expected/desired level. The two universal technologies ICCT and NT are expected to solve these basic and advanced problems along with other supportive technologies like Bio-technology (BT) and Gravitation technology (GT).

2. OBJECTIVES OF THE STUDY :

This study is intended to discuss the perspectives and the progress of nanotechnology as an ideal technology to solve some of the major medical issues like drug delivery, treating cancer, surgery, organ regeneration, and even anti-aging. The study also discusses the concepts to know the possibility of using it through various concepts and techniques to be developed during this century to provide various medical related nanotechnology issues like nanorobots, human resurrection &artificial body with the original brain, connecting brains to cloud &internet, and overtaking of human intelligence by machines. Further, the paper discusses the possibility and challenges of achieving the human immortality and its implications.

3. NANOTECHNOLOGY AS NEW HOPE TO REALIZE IDEAL TECHNOLOGY :

Nanotechnology focuses on building and manipulating materials (1-100 nm) that are a millionth the size of the length of an ant (typically 6-12 mm in length). Not only do nanotechnologists focus on building these materials but they want them to be functional and useful in an array of applications including therapeutics. Nanotechnologists alongside clinicians and biologists are making strides towards defeating mortality, or death, in a quickly growing area of study known as nanomedicine. Future research advances in nanomedicine are expected to support life extension through the possible repair of many processes in the human body thought to be responsible for aging of the human being. One of the founders of nanotechnology, K. Eric Drexler [12], proposed cell repair machines in his book 'Engines of Creation' 1986, by using hypothetical molecular computers called nanobots, which are used to operate within the body cells. Raymond Kurzweil, a futurist and transhumanist writer, proposed in his book on '*The Singularity Is Near*' that nanorobots can completely provide a remedy for the process of aging by 2030 [13]. A well-known and highly respected innovator and visionary Peter Diamandis M.D., MIT graduate and Founder/Chairman of XPrize and Singularity University, addressed the future of nanomedicine saying "*We're going to*

look at your genome and all of your body's systems and identify what's likely to kill you and find it before it does. So, stopping you from dying is the first bit."

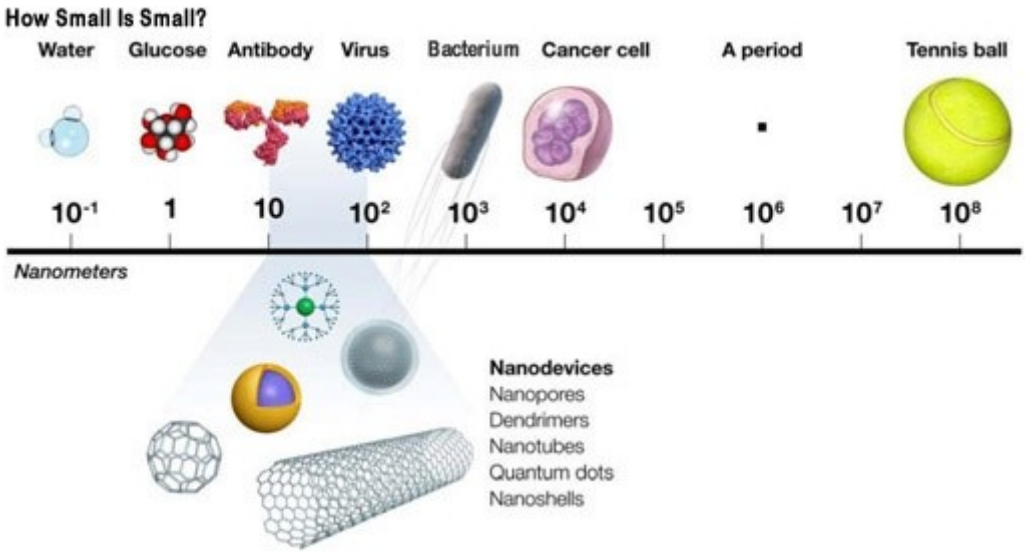

Fig 1 : Nanoscale :Adopted from http://bit.ly/howsmallissmallscale [14]

Table 2 : An idea on various breakthroughs expected in nanotechnology advents

S. No	Breakthrough Issues	Technology	Universal Technology
1	Nanorobots	Nano-biotechnology	NT
2	Human Resurrection & Artificial body with original brain	Artificial Intelligence	ICCT & NT
3	Connecting brains to cloud & Internet	Artificial Intelligence	ICCT
4	Singularity	Nanotechnology, Artificial Intelligence	NT & ICCT

3.1 Nanobots :

Nanobots are robots that are microscopic in nature, measured largely on the scale of nanometers. They are currently in the research and development phase, but on realization, they are expected to do specific tasks at the atomic, molecular and cellular level and help in bringing about many breakthroughs, especially in medical science. Nanobots are also known as nanomachines, nanorobots, nanomites, nanites or nanoids. The circulatory system of living beings is a natural highway for nanobots which will cruise through the bloodstream to the area of distress. They may be used to attach themselves to specific cells, such as cancer cells, and report the position and structure of these tissues.Nanobots can be considered to be a machine version of a bacteria or virus. They can be biological or synthetic but are adapted to perform preprogrammed tasks at the atomic level. They are expected to be autonomous in nature and powered by a small cell or battery, or even solar cells. The whole idea behind nanobots is in having a device which can interact at the nanoscale and help in understanding or manipulating structures at the nanoscale level. In the development of nanobots, nanoassembly and nanomanipulation have important roles.

Nanobots is an emerging field of nanotechnology creating machines or robots whose parts are in nanometre scale. Considering their potential, nanobots find their first and most prominent applications in medical science. Applications such as closing open wounds, rebuilding ruptured arteries and veins and traversing through the body for diagnoses are some important possible realizations. They are expected to aid in research related to cancer, AIDS and other major diseases as well as in helping brain, heart and diabetes research. Other applications where nanobots can potentially be of use are in aerospace, security, defense, electronics and environmental protection [15].

Nanobots/robots can be programmable and updatable to find and destroy any irregularities in the human body much like a virus or malware program on a computer. Exosome sensing capabilities and intercellular communication analysis will allow nanomachines to real time information about our total body health. This information will most likely include the current inflammation levels of human beings especially according to specific body locations which could be particularly useful after surgeries or even by athletes after intense training or sporting events. Nanomachines will be able to detect diet changes and how human bodies respond to differences in nutrients intake. Nanomachines will be able to act as biosensors for temperature, heart rate, LDL/HDL levels as well as neurotransmitter indication of mental states such as sadness, happiness, depression, and anxiety. Nanomachines will be completely wifi/bluetooth/or some future variant for direct and seamless communication to handheld technology. The implications of such monitoring are practically endless. Sensors in babies will give information about their health and mental health that can't be communicated to us through language to their parents. Emergency rooms will be revolutionized as doctors will no longer need to take physicals or blood tests.

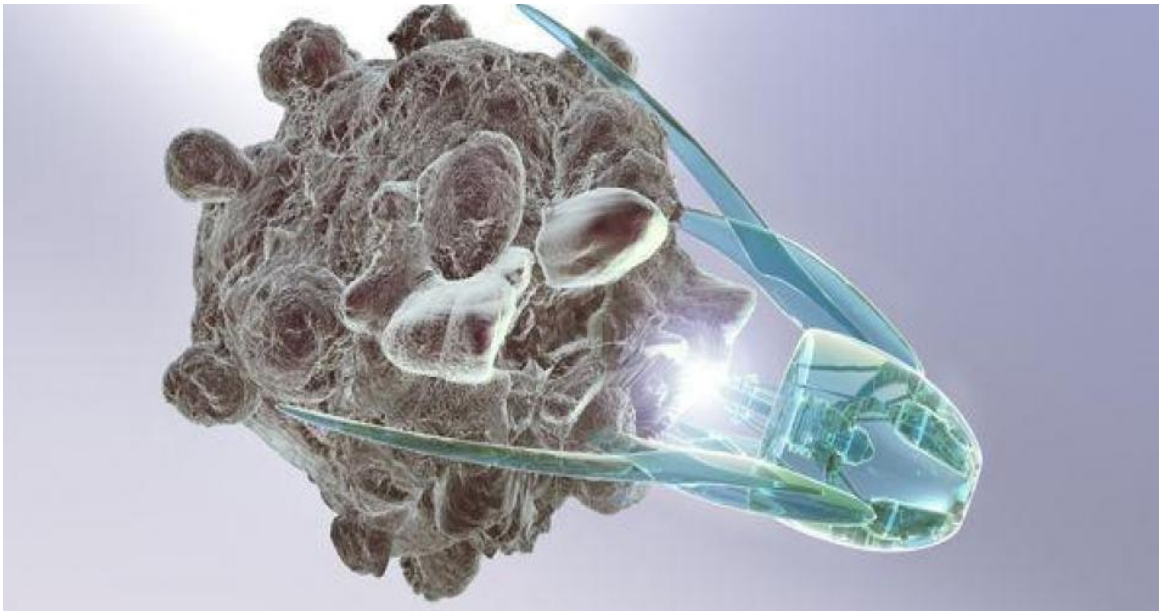

Fig. 2 : Nanobot as a killer of cancerous cells. Adapted from Chris' Blog at http://dbdblog.com [16]

3.2 Cell Replacement :

It is predicted that by the year 2040, nanotech machines called nanobots are developed in such a way that they can move throughout our bodies, repairing damaged cells and organs, effectively curing and wiping out any diseases and also be able to back up our memories and personalities.Thus, anyone lives from 2040 to 2050 could be close to immortal. The process collaboration between man and machines through nanotechnology as nanobots moves through human bloodstreams and eventually even replace or modify biological blood. It is also estimated that the combined research and discoveries of nanotechnology and biotechnology will vanish all dangerous diseases like cancer, alzheimer's diseases, diabetes, and obesity by eliminating biological diseases and aging leading to lifespan expansion. This helps to extend the health and longevity of human beings. Nanotechnology based boats are expected to heal wounds almost instantaneously and able to regenerate human and animal body parts so that the person injured in accidents can also be cured instantaneously. Many types of cancers are already cured successfully at laboratory level using nano-bio technology. Nanobots are micro-machines and will be self-replicating to the required level within the living body to function as per they are programmed [17].

It is also expected that nanotechnology along with ICCT and BT is able to freeze human brain, create artificial new body, repair any damage happened even to the human brain, and transfer it into a new body. This process could then be repeated in perpetuity to reach perfect immorality.

As per various reports, the three diseases which are major contributors to all deaths all over the world are heart disease, cancer, and chronic lower respiratory diseases. Table 3 lists the estimated world over a percentage of the people dies annually [18].

Table 3 : Percentage of mortality worldwide due to major diseases.

S. No	Name of Disease	Number of deaths annually	Percentage
1	Heart	20 million	30 %
2	Cancer	10 million	15 %
3	Lower respiratory diseases	3 million	05 %

(1) Nanotechnology supported heart disease Research :

Heart Disease research using nanotechnology is not as well supported by government and industrial funds but there have been some remarkable innovations to improve patients' lives. Nano-biomaterials are beginning to be used for blood vessel replacement, bioresorbable stents, cardiac patches, and local drug delivery. To overcomeconventional limitations of drug delivery, nano delivery methods are used for more precise and long-lastingdiseases especially in combination with stem cell therapy, gene delivery, tissue factor (TF) inhibitors, miRNAs, leukotriene modifiers and thrombolytic agents. Researchers are using nanoparticles to overcome common, current issues in cardiovascular care such as systemic toxicity and stent thrombosis. Finally, cardiologists and researchers are successful in using nanomedicine in the treatment of atherosclerosis which results in heart attacks and strokes among many people around the world each year [18].

(2) Nanotechnology and Cancer Research :

Cancer research using nanomedicine is a very effective and fast-growing field with many important innovations and discoveries announced recently. Many research groups are using gold nanorods to be injected and stored in tumourswhich improves diagnostic capabilities by means ofusing photothermal technology to heat the rods which can specifically kill cancer cells. In another case, a team of researchers works with nanoparticles carrying TNF-related apoptosis-inducing ligand (TRAIL) to specifically to the tumourcells to kill cancer cells and cancer stem cells which are particularly susceptible to this methodology. Using nanoparticles it is possible to overcome many previous restrictions for delivery of drugsto tumoursand overcoming certain barriers such as blood-retinal and blood-brain blocks. Using another technique called nano delivery of viral or non-viral gene induction which supports programmed cell death (apoptosis),researchers and doctors are working to handle and control the killing of fast growing and metastatic cancer cells. Using Boron Neutron Capture Therapy (BNCT) along with the delivery properties of nanoparticles is a more recent therapeutic technique to kill tumour cells effectively. These are many examples and techniques for using nanotechnology to control cancer by cancer researchers and oncologists [18].

In the year 2018, researchers for the first time successfully used tiny, nanometre-sized robots to treat cancerous tumours in mice. Researchers from Arizona State University and the National Center for Nanoscience and Technology of the Chinese Academy of Sciences injected nanobots made from a folded sheet of DNA into the bloodstream of mice. These targeted the blood vessels around cancerous tumours, injecting them with blood-clotting drugs to cut off their blood supply. According to the study, published in Nature Biotechnology, in February, the treatment was successful in shrinking the tumours and inhibiting their spread. The idea of armies of minuscule robots patrolling our bodies, cleaning and maintaining them has been a theme in science fiction for decades. Scientists are exploring the use of nanobots for a number of healthcare uses, not only for fighting cancerbut also to unblock blood vessels in hard to reach areas, taking biopsies or measuring the level of certain chemicals in otherwise inaccessible areas of the body. Bioengineered bots made from DNA, such as those used in the mouse tumour tests, have been shown to be capable of delivering small doses of drugs with great precision.

(3) Nanotechnology and Respiratory Research :

Though the amount of funding is limited form Govt. and industrial sources for research in nanomedicine, researchers are addressing the problems of lower respiratory Infections. They found

that nanoparticle encapsulation of antimicrobial chemo drugs decreases the toxicity to patients, increases antibiotic resistance activity of drug resistant bacteria. TB is the second deadly disease due to infection worldwide mainly due to limitations in drug delivery, patient compliance, and multiple drug resistant strains. Medicines using nanoparticles will support the delivery of drugs intracellularly by focussing on infected macrophage parts and stimulate them simultaneously to cure TB. It is also shown that nanomedicine has the ability to overcome antibiotic resistance. Nanomedicine used for treating azithromycin microspheres also shown improvements in curing macrolide-resistant streptococcus pneumonia strains in many patients. Thus, nanomedicine research for curing respiratory diseases have shown tremendous opportunities in future days [18].

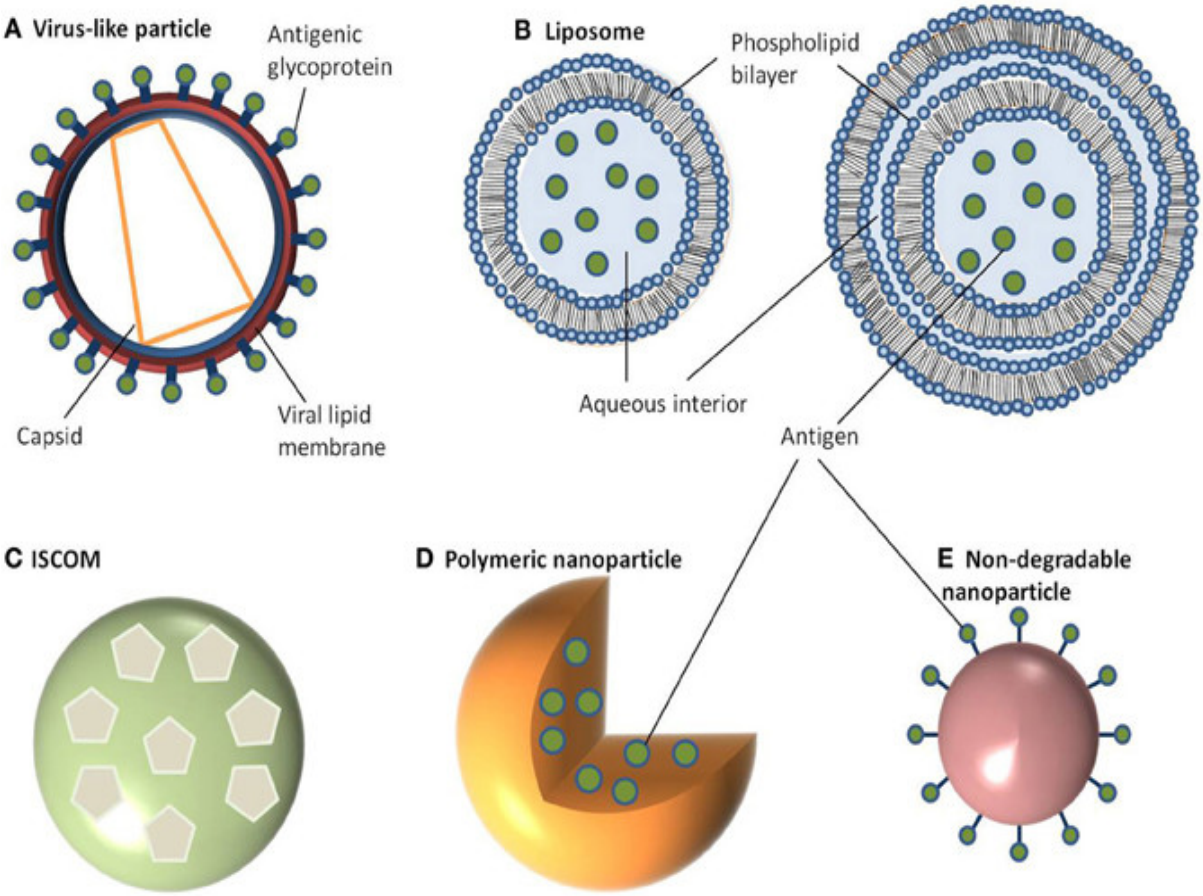

Fig. 3 : Nanoparticle with Virus-like Particles (VLPs) Photo source http://bit.ly/vaccinenanoparticledelivery. [19]

3.3 Regeneration of Body Parts :

Regeneration means the regrowth of a damaged or missing organ part from the remaining tissue. As adults, humans can regenerate some organs, such as the liver. If part of the liver is lost by disease or injury, the liver grows back to its original size, though not its original shape.Every cell in our body contains DNA which has the genetic footprint with the required information to build or regenerate the body. But the automatic regeneration is difficult due to the possible reason that the regeneration of human organs may take a huge amount of energy. Further the complex and highly developed human immune system opposes the process of regeneration of body parts. It is hoped that the techniques like gene activation or gene editing to start the regeneration process may help such possibilities.In one technique, nanoscaffolds prepared polymer fibres are used as a substitute for missing limb or damaged organ. The nanoscsffold monitor adhesion of cells on to it so that the missing bones and tissues can be reconstructed [20-21].

Table 4 : Nanotechnology based body parts regeneration research

S. No	Body Parts	Nanotechnology Solution	Reference
1	Organ Regeneration	3D Printing	[22] Biazar, E. et al, (2018)
2	Tissue Regeneration	Integration of nanocomposites and biomimetic scaffolds.	[23] Cassidy, J. W. (2014).
3	Bone Regeneration	Calcium Silicate Nano-Composites	[24] Mollaqasem, V. K., (2014)
4	Blood (Artificial)	Bio-inspired nanocomposites	[25] Sen Gupta, A. (2017)
5	Cells Regeneration	Stem cell tracking with nanoparticles	[26] Accomasso, L., (2016)
6	Limb Regeneration	**Nanostructured polymeric scaffolds**	[27] Laurencin, C. T., (2016)
7	Skin Regeneration	Bioinspired Nanotechnology	[28] Tavakol, S., (2016)
8	Bone Joints Regeneration	bio-nanomaterials the emerging prospect for therapy	[29] Gangadoo, S., (2015)
9	Nerve Reconstruction	bio-functionalized nanomaterials	[30] Sedaghati, T., (2015) [31] Biazar, E., (2010)
10	Blood vessels Repair	Modeling Nanorobot Control Using Swarm Intelligence	[32] Kaewkamnerdpong, B., (2015)
11	**Musculoskeletal Soft Tissues**	Advanced biomaterials and biomimetic scaffold designs	[33] James, R., (2016)

3.4 Environmental Purification :

Experts all over the world are in consensus that one of the major factors that will determine the future of human health is the health of our environment and the planet. In the environmental sciences, nanotechnology is a very hot topic, especially when addressing environmental sustainability and reversal of environmental damage caused by the actions of mankind. Nanotechnologists alongside environmental experts have been able to utilize nanomotor degradation and removal of contaminants from water sources. Environmentalists are excited about the use of this technology for water quality monitoring and eventually would like to see "sense and destroy" applications. Future directions in this field even entail immunology influenced chemotactic abilities capable of allowing nanomachines to track contamination back to its source for clearance and reporting to the appropriate authorities. In environmental applications of nanotechnology, a kind of nanorobots called nanomachines can self-replicate under pre-determined, set conditions, can potentially help people to control the changesin the environment. Nanorobots can be programmed to act like a buffer to prevent environmental changes, and help to maintain predetermined temperatures and pressure conditions. Nanomachines also have the ability to act like a chemical factory to process excessive levels of CO_2 from the air or produce nontoxic endothermic or exothermic reactions to heat or cool the environment. Thus, nanomachines can be used to cool the oceans to prevent further melting of artic ice. The light reflective properties of nanomaterials added to the oceans can be altered and hence by decreasing or increasing the oceans ability to absorb sunlight could have considerable effects on global warming. Such possibilities for solving various environmental problems and pollutions are truly endless and exciting to for further research. Nanotechnology not only has tremendous implications for the monitoring of human health but also in real time monitoring of the environment and its purification in ways before never thought possible.

3.5 Connecting Brains to Cloud &Internet :

While forecasting futuristic technology, it is predicted that a time will come for connecting our brains to computers in the cloud through the internet. Computers and mobile phones are already billions of times the speed and powerful than their predecessors and now one can connect them to the internet where millions of computers living in the cloud. According to Ray Kurzweil, director of engineering at Google [34], humans will have hybrid brains able to connect to the cloud, just as with computers. The brains and computers will all be connected using DNA strands called *Nanobots or nanorobots and* synthetic neocortex. In this cloud, thousands of computers can be connected to update human intelligence. The larger the cloud, the thinking becomes more complicated due to the *combination of biological and non-biological thinking processes*. Ray Kurzweil also foresee that by the end of 2030, human thinking should be almost entirely non-biological and able to work like an external hard drive with the ability to backup information using technology. This also will increase the ability of the human mind. Continuation to this concept, we predict that **s**uch networks further leads to connecting many brains and computers together and if happens a **Universal Super Intelligence (USI) System** may evolve. Such USI System is expected to connect many brains and computers in the universe to automatically store and exchange information and intelligence anywhere in the network ubiquitously. The technology of USI system will give rise to access to a wider field of consciousness by connecting and using the aggregate thinking powers of millions of humans at a time which increases the thinking power exponentially and supports the new world of innovation, design, and an abundance of wealth. This concept of Universal Super Intelligence (USI)along with universal artificial intelligence (UAI) [35-39] also leads to the evolution of **Super Human Beings (SHB)**as shown in the diagrammatic idea (fig 4).

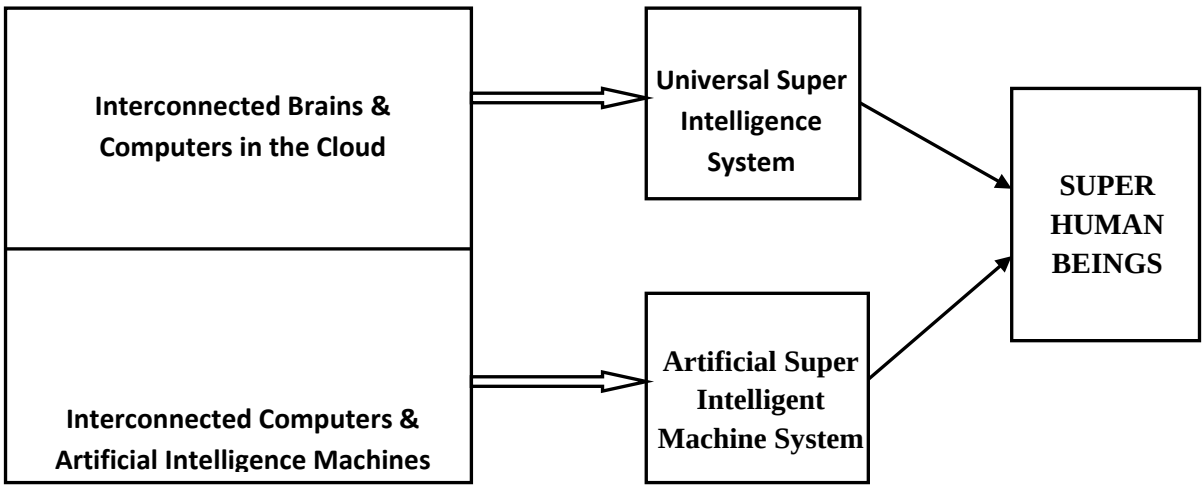

Fig. 4. Hypothetical Concept of Universal super intelligence, Artificial super intelligence, and Superhuman beings.

3.6 Singularity :

The Singularity is a hypothetical concept to be created in the future due to the invention of super-intelligent machines which are network connected intelligent computers & machines. Super intelligence is a cognitive capacity created technologically which is far above the general thinking capacity of humans. The technological singularity is predicted and the name is coined by VernorVinge [40] which is a hypothesis that the discovery of artificial superintelligent machine systems will abruptly trigger runaway technological growth to an infinite amount, resulting in unfathomable changes in the society and to human civilization [13].Artificial superintelligence is a term referring to the time when the capability of computers and artificial intelligence machines will surpass humans. At the time when the technical singularity is created, the artificially developed nonbiological intelligent machines are expected to be several billion times powerful compared to all human intelligence available today.

The question is whether the Singularity occurs and when? The answer is yes. The technology will advance continuously and grow beyond our ability to foresee or control its outcomes and the society and the world will be transformed beyond our recognition by using superintelligence created through the singularity to solve human problems, including poverty, energy, disease, and even mortality. Advents in nanotechnology, biotechnology, artificial intelligence, and robotics duringthe next 30 years are expected to play an important role in the realization of Singularity. The singularity theory predicts that the super-intelligency will be created by self-directed networked computersand will increase further exponentially rather than incrementally. There are many proposed mechanisms for adding superintelligence to humans which include concepts like brain-computer interfaces, artificial intelligence (AI) brain implants,biological alteration of the brain, and genetic engineering. The humanity and the world scenario would be quite different after the singularity status is reached in such a way that a human being could potentially scan his consciousness into anexternal computer and live eternally in the form of virtual reality or as a sentient robot leading the status of Super-human being. Thus, the combination of two technologies, ICCT along with AI, and Nanotechnology have the ability to either push the human species into a new and beautiful future which can be called as a golden era or if the technology is not properly managed and controlled will also may bring our downfall with unprecedented disaster. At least, it's comforting and happiest to know that our best and brightest future will be at the helm of this journey as it moves closer towards immortality [41-44].

4. CONCEPT IDEAL HUMAN BEING :

When we model human being as a perfect person, we assume some characteristics of a human being which makes him ideal. These characteristics can be divided into his physical capabilities, mental capabilities, and ethical behaviour. Ideal human being concept will help to identify a 'God-like' person in the society with 3 primary characteristics as omnipotence with supreme power, omniscience with all knowing (past, present, and future), and omnipresence with ubiquitous. The above three characteristics of God can be developed by human beings either by using scientific technology or by means of spiritual philosophy. Thus, there are two parallel paths (may be interconnected) for human beings to earn the characteristics of human Model of God. They are (1) Achieving super-human-being status through the technological singularity and universal super-intelligent system. (2) Achieving super-human-being status through spiritual philosophy. In both paths, they may reach super-human status [45].

According to Indian sage Swami Vivekananda, man is usually enlightened by nature divine. All humans are 'heirs of immortal bliss'. Due to wrong education and theories, they forget their divinity and essential goodness. As a consequence, he starts believing that he is a sinner. This makes him to starts worshipping and pursuing the external matter and hence forgets spirituality within. He believes that every human being has a God within him and he says that right kind of education creates awareness on their divinity. Such a right education could result in making matured and enabling them to respect others including their neighbours, fellow citizens, immediate surroundings and their environment to get enlightened with ten noble characteristics including contentment, forbearance, gentleness, respect for others' property, purity, self-control, knowledge, philosophic wisdom, veracity, and patience. An enlightened person, according to Vivekananda, by virtue of his training and education, is able to see the same Atman in every being and therefore treats them at par, even identical with himself [46-49].

5. HOW TO ACHIEVE IMMORTALITY :

Immortality is a state of human beings where they are immune to death for any reason like injury, disease, and age. Every human being has a desire to achieve immortality provided they are able to overcome aging old. It is believed that like two paths to achieve superhuman status, there are two paths to achieve immortality. Accordingly, they are named as (1) Immortality based on Philosophy, and (2) Immortality based on Technology. Technology based immortality promotes physical deathlessness and Philosophy based immortality promotes mental based eternal enlightenment.

5.1 Philosophy Based Immortality:

Immortality is discussed intensively in many Epics & Religious text. From the beginning of human

life on the earth, there was continuous search, efforts, and struggle to achieve immortality. Some of the instances and references on immortality in different epics and religious text are mentioned below:

5.1.1 Hindu Philosophy :

Hindu scripture contains a mantra about the seven immortals, in which their names are recited for luck and longevity: AshwathaamaBalirVyasahaHanumanthraVibeeshanahaKribaParasuramas cha SaptaiteyChiranjeevinaha Om NamahShivay It is also specified that other persons named Markandeya, and had a boon that he will never die and is blessed with immortality [50].

Table 5 : List of some of the immortal characters in Hindu Epics/ Mythology

S. No.	Name of Immortal Characters (Chiranjivis)	Specification	Epics
1	Ashwathhama	Son of Dronacharya	Mahabharata
2	Vibhishana	Youngest brother of Ravana	Ramayana
3	Kripacharya	Son of Shardwan and Janpadi and used to teach the royal children, Kauravas, and Pandavas	Mahabharata
4	Hanuman	Pavan Putra	Ramayana
5	Parshuram	He is one of the anshawatar of Lord Vishnu (sixth avatar), and known as guardian angel, savior of mankind.	Mahabharata
6	Bali Chakrawarthi	Powerful ruler in Hinduism ever. Lord Vishnu granted immortality	Hindu Puranas
7	Rishi Vyas	Creator of many Puranas &storyteller of Mahabharata	Mahabharata

There are several other personages known as chiranjeevins, like Jambavantha (Jambavan). However, in Hinduism, "immortal" does not mean eternal. Even immortal things are dissolved at the end of the universe, including its secondary creator Brahma. The only eternal are **Vishnu** and **Shiva** of the Trimurti, i.e. manifestations of Brahman (the Supreme Reality), Sheshanaga (the Eternal Serpent), and the four Vedas.

5.1.2 : Cristian Philosophy :

According to the Christian tradition immortality in humans are endowed with non-physical souls. It is an attribute of the soul, and the body is its prison. The soul will be freed after the death of a person. The resurrection of humans on account of Christ who was first raised from the dead. The immortality in Christianity is a gift and only God is immortal. Immortality means the resurrection of the body. Christ's bodily resurrection, although as a body endowed with properties not limited to spatial restriction was the object of Christian hope that body and soul in their unity would be raised after death [51]. Thus Christianity believes in the immortality of the soul. Dr. Temple, archbishop of Canterbury wrote that Man is not by nature immortal, but capable of immortality. He said, the God alone is immortal and he offers immortality to man not universally but conditionally [52-53].

6. TECHNOLOGY BASED IMMORTALITY :

There are three ways of achieving human life immortality.

(1) ***Renewing the body by rejuvenating it by means of Nano-bio Technology :*** This is supported by regaining the biological young body by preventing the aging of body cells or by replacing vital body organs with new parts.

(2) ***Living in artificially created Android bodies :*** This includesthe ability to link human minds with the robotic machine effectively be living in the cloud. This means that even when the original bodies die, the minds can still be able to live in the world using highly realistic robot bodies.

(3) ***Living in a virtual world :***This is virtual immortality developed using artificial intelligence and virtual reality techniques.

7. CHALLENGES TO ACHIEVE HUMAN IMMORTALITY :

(1) Technical Challenges : Developing nanobots, feeding them into the human body without risk, and controlling to work in human body in-search of its destination either for repair cells and body parts, or regeneration of various body parts using nanobots ate challenging and highly sophisticated laboratories are essential throughout the world. Technical challenges can be handled effectively by means of creating awareness and developing more experts in the field.

(2) Biological Challenges : Identifying the causes of aging at the cellular level and solving them to stop aging of human beings and the basic biological challenge. We can also prolong the natural lifespan by preventing cell death and aging, preserving it through cryogenic methods or donors. scientists believe to be able to achieve immortality:

- **Discovering the Gene Power:** Scientists have the challenge to find the suitable gene which can support immortality and to implant it in the human body.
- **Successful Cloning:** Bio-technologists have a challenge to regenerate or replacement parts of the body or even cloning of a whole human being. Cloning is considered as a part of immortality research and presently it is evolved to the most desired level.
- **Cryogenics Technology for Body Preservation :**This technology helps to preserve the organism, and may help to keep the patient into cryogenic sleep until the medicine to their disease is found.

(3) Social Challenges : The immortality research may not receive full support from the people of the society over the world with the belief that it may have unimaginable social cultural problems. The mortal society makes the people to be more generous and honest due to the effect of aging and assured end of the life. If people think that they are going to be immortal the basic beliefs and culture of the society will be affected. The anticipated challenges include the justification on investment on immortality research, its effect on the economy, belief, culture and tradition of the people of the society.

8. IMPLICATIONS OF ACHIEVING PHYSICAL IMMORTALITY :

The following are the implications of achieving physical immortality for human beings :

(1) Deathlessness : Human mortality leads to tumbled motivation and time target for any activity. This may also kill innovation ability of human beings due to the fact that there is no further threat for human life. The natural desires, interests, and goals that the human beings have now—then eventually decreases and as time progress, everybody will get bored and feels eternal life unbearably tedious.

Deathlessness life may be like being in heaven without any challenges but only with enjoyment. This leads to boar to many people who may search for change through further innovations through technology like high speed space travel etc.

(2) Static Time : Time is not going to be an important and non-repeatable resource. This may lead to non-active society. The people may become tension free and the life style may change entirely. The static time from the human beings' point of view may create opportunities for new research leading to new scientific laws & principles.

(3) Space : The immortality leads to increase in population so that the density of population increases continuously with time. Unless major part of the population finds relocation to other planets in the universe, the space constraints create various kind of problems which may end up with wars and fighting and hence people may find peace less life. On the other hand, using sophisticated technologies the space travel may common for everybody and in the process of finding the change in lifestyle, the majority of people may travel different space stations and new planets of different stars in the universe which may create new colonies in distant planets and galaxies.

(4) Population : Immortality of human beings leads to overpopulation on this earth. Already many countries are facing overpopulation problems and end of aging and immortality would lead to an accelerated population growth and eventually aggravate overpopulation problems in some regions of the world. The optimum solution to this problem is the relocation of additional population to other

planets which is also possible through universal technologies.

(5) Beliefs &Culture : Curing aging leads to continuation of older people along with their culture. This will probably force to continue their ideas, beliefs, and culture and would block the way to the younger generations and their fresh ideologies and beliefs. Culturally, or mimetically, humankind has been evolving at an astonishing pace. The continuous improvements and extraordinary evolution in culture and tradition with time due to changes in generations in the society have changes the ethics and behaviour of the people may stop and we may end up with a generation of people without cultural progress which could be a catastrophe for humankind.

(6) Social Problems : Achieving immortality leads an infinite lifespan for human beings. This will create a social problem of wealth divide as the richer will be come further richer and the poorer will become further poorer. But there is another argument that people produce more due to experience effect. Hence poverty will quickly be eradicated. Poverty is almost entirely a problem of lack of human productivity. If people produce more than they consume they aren't in a state of poverty but of surplus.

Apart from many negative implications, immortality may promote many new opportunities and new solutions to anticipated problems and issues, provide a happy and prosperous day for everybody. Achieving immortality against aging is always better than the ravages and sufferings of aging and age-related chronic diseases in general.

9. CONCLUSIONS :

The search for lifespan extension and non-aging leading to human immortality is the objective of every technology. The frontier technologies like ICCT and Nanotechnology are expected to contribute to this long-time desire of human beings due to their abilities of grown as complementary and universal technologies with the capability to elevate towards ideal technologies. It is expected that with continuous contributions on ICCT and NT technologies by many researchers from different parts of the world, human life is certainly going to be more comfortable and the definition of technology is finding its real meaning by its contribution of supporting to solve people's real problems both at its basic and advanced level and marching towards achieving immortality. Managing such technological innovations systematically in order to lead the expected outcome is the real opportunity and challenge for technology management experts. In this process of managing progress in technology innovations fail while marching towards mortality to immortality, it is sure that at least it will try and contribute for solving humankind's problems like hunger, thirst, war, and suffering from health-related issuesto wipe every tear from every eye as said by Abraham Lincoln. Finally, the ultimate goal of the science and technology should be the search forpeace and harmony by and for human beings to continue their existence forever and the discovering the secrets of the universe.

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