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ADVANCED CHALLENGES OF NANO TECHNOLOGY BASED ACCOUNTING

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ABSTRACT

Computers are used in almost every field. Advancements in nanotechnology brought drastic changes in computing capabilities. Accounting plays significant role in maintaining data and to obtain information. This paper focus on challenges of nanotechnology based accounting for accurate and fast performances.

Keywords: Media, Transistors, Software, Data

I. INTRODUCTION

Nanotechnology is the engineering of functional systems at the molecular scale.

Nanotechnology draws its name from the prefix "nano". A nanometer is one-billionth of a meter—a distance equal to two to twenty atoms (depending on what type of atom) laid down next to each other. Nanotechnology refers to manipulating the structure of matter on a length scale of some small number of nanometers, interpreted by different people at different times as meaning anything from 0.1 nm (controlling the arrangement of individual atoms) to 100 nm or more (anything smaller than microtechnology). Richard Feynman was the first scientist to suggest (in 1959) that devices and materials could someday be fabricated to atomic specifications. "The principles of physics, as far as I can see, do not speak against the possibility of maneuvering things atom by atom." This concept was expanded and popularized in a 1986 book Engines of Creation by K Eric Drexler, who applied the term nanotechnology to Feynman's vision.

The term "nano-technology" had been coined in 1974 by Norio Taniguichi to describe semiconductor processes involving control on the order of a nanometer. From the mid-1980s on progress in nanometer-scale science and technology exploded, and the term nanotechnology was appropriated by researchers, media, businesses, and funding agencies to refer to any technology in which control of the structure of matter on a scale of nanometers to tens of nanometers to hundreds of nanometers in at least one dimension enabled unique phenomena and novel applications.

The Foresight Institute is still focused on the original meaning of the term: atomically-precise manufacturing or "molecular manufacturing". Nevertheless, incremental progress in nanometer-scale science and technology expands the toolkit that can be used to develop atomically-precise manufacturing, and provides benefits to encourage further investment in nanotechnology.

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II. LITERATURE REVIEW

Nanotechnology is a relatively recent development in scientific research, the development of its central concepts happened over a longer period of time. The emergence of nanotechnology in the 1980s was caused by the convergence of experimental advances such as the invention of the scanning tunneling microscope in 1981 and the discovery of fullerenes in 1985, with the elucidation and popularization of a conceptual framework for the goals of nanotechnology beginning with the 1986 publication of the book Engines of Creation. The field was subject to growing public awareness and controversy in the early 2000s, with prominent debates about both its potential implications as well as the feasibility of the applications envisioned by advocates of molecular nanotechnology, and with governments moving to promote and fund research into nanotechnology. The early 2000s also saw the beginnings of commercial applications of nanotechnology, although these were limited to bulk applications of nanomaterials rather than the transformative applications envisioned by the field.

The American physicist Richard Feynman lectured, "There's Plenty of Room at the Bottom," at an American Physical Society meeting at Caltech on December 29, 1959, which is often held to have provided inspiration for the field of nanotechnology. Feynman had described a process by which the ability to manipulate individual atoms and molecules might be developed, using one set of precise tools to build and operate another proportionally smaller set, so on down to the needed scale. In the course of this, he noted, scaling issues would arise from the changing magnitude of various physical phenomena: gravity would become less important, surface tension and Van der Waals attraction would become more important.

After Feynman's death, scholars studying the historical development of nanotechnology have concluded that his actual role in catalyzing nanotechnology research was limited, based on recollections from many of the people active in the nascent field in the 1980s and 1990s. Chris Toumey, a cultural anthropologist at the University of South Carolina, found that the published versions of Feynman's talk had a negligible influence in the twenty years after it was first published, as measured by citations in the scientific literature, and not much more influence in the decade after the Scanning Tunneling Microscope was invented in 1981. Subsequently, interest in "Plenty of Room" in the scientific literature greatly increased in the early 1990s. This is probably because the term "nanotechnology" gained serious attention just before that time, following its use by K. Eric Drexler in his 1986 book, Engines of Creation: The Coming Era of Nanotechnology, which took the Feynman concept of a billion tiny factories and added the idea that they could make more copies of themselves via computer control instead of control by a human operator; and in a cover article headlined "Nanotechnology",[2][3] published later that year in a mass-circulation science-oriented magazine, OMNI. Toumey's analysis also includes comments from distinguished scientists in nanotechnology who say that "Plenty of Room" did not influence their early work, and in fact most of them had not read it until a later date.[4][5]

These and other developments hint that the retroactive rediscovery of Feynman's "Plenty of Room" gave nanotechnology a packaged history that provided an early date of December 1959, plus a connection to the charisma and genius of Richard Feynman. Feynman's stature as a Nobel laureate and as an iconic figure in 20th century science surely helped advocates of nanotechnology and provided a valuable intellectual link to the past.[6]

In 1980, Drexler encountered Feynman's provocative 1959 talk "There's Plenty of Room at the Bottom" while preparing his initial scientific paper on the subject, "Molecular Engineering: An approach to the development of general capabilities for molecular manipulation," published in the Proceedings of the National Academy of Sciences in 1981.[1] The term "nanotechnology" (which paralleled Taniguchi's "nano-technology") was independently applied by Drexler in his 1986 book Engines of Creation: The Coming Era of Nanotechnology, which proposed the idea of a nanoscale "assembler" which would be able to build a copy of itself and of other items of arbitrary complexity. He also first published the term "grey goo" to describe what might happen if a hypothetical self-replicating machine, capable of independent operation, were constructed and released. Drexler's vision of nanotechnology is often called "Molecular Nanotechnology" (MNT) or "molecular manufacturing."

His 1991 Ph.D. work at the MIT Media Lab was the first doctoral degree on the topic of molecular nanotechnology and (after some editing) his thesis, "Molecular Machinery and Manufacturing with Applications to Computation,"[11] was published as Nanosystems: Molecular Machinery, Manufacturing, and Computation,[12] which received the Association of American Publishers award for Best Computer Science Book of 1992. Drexler founded the Foresight Institute in 1986 with the mission of "Preparing for nanotechnology." Drexler is no longer a member of the Foresight Institute.

Nanotechnology is already enhancing everyday products such as sunscreens, golf clubs, clothing, and cell phones. Within the next decade, it will be commonplace in drug therapies, water filters, fuel cells, power lines, computers, and a wide range of other applications. Widespread commercial adoption of nanotechnology is growing rapidly. Examples of areas in which nanotechnology is expected to have a high commercial impact include:

Near-term (1-5 years)

Long-lasting rechargeable batteries

Improved chemical & biological sensors

Point-of-care medical diagnostic devices

Mid-term (5-10 years)

New targeted drug therapies

Enhanced medical imaging

High-efficiency, cost-effective solar cells

Long-term (20+ years)

New molecular electronics

New all-optical information processing

New neural prosthetics for health care

III. APPLICATIONS

Nanoscale additives in polymer composite materials for baseball bats, tennis rackets, motorcycle helmets, automobile bumpers, luggage, and power tool housings can make them simultaneously lightweight, stiff, durable, and resilient.

Nanoscale additives to or surface treatments of fabrics help them resist wrinkling, staining, and bacterial growth, and provide lightweight ballistic energy deflection in personal body armor.

Nanoscale thin films on eyeglasses, computer and camera displays, windows, and other surfaces can make them water-repellent, antireflective, self-cleaning, resistant to ultraviolet or infrared light, antifog, antimicrobial, scratch-resistant, or electrically conductive.

Nanoscale materials in cosmetic products provide greater clarity or coverage; cleansing; absorption; personalization; and antioxidant, anti-microbial, and other health properties in sunscreens, cleansers, complexion treatments, creams and lotions, shampoos, and specialized makeup.

Nano-engineered materials in the food industry include nanocomposites in food containers to minimize carbon dioxide leakage out of carbonated beverages, or reduce oxygen inflow, moisture outflow, or the growth of bacteria in order to keep food fresher and safer, longer. Nanosensors built into plastic packaging can warn against spoiled food. Nanosensors are being developed to detect salmonella, pesticides, and other contaminates on food before packaging and distribution. High-resolution image of a polymer-silicate nanocomposite. This material has improved thermal, mechanical, and barrier properties and can be used in food and beverage containers, fuel storage tanks for aircraft and automobiles, and in aerospace components. (Image courtesy of NASA.) Nano-engineered materials in automotive products include high-power rechargeable battery systems; thermoelectric materials for temperature control; lower-rolling-resistance tires; high-efficiency/low-cost sensors and electronics; thin-film smart solar panels; and fuel additives and improved catalytic converters for cleaner exhaust and extended range.

Nano-engineered materials make superior household products such as degreasers and stain removers; environmental sensors, alert systems, air purifiers and filters; antibacterial cleansers; and specialized paints and sealing products.

Nanostructured ceramic coatings exhibit much greater toughness than conventional wear-resistant coatings for machine parts. In 2000, the U.S. Navy qualified such a coating for use on gears of air-conditioning units for its ships, saving $20 million in maintenance costs over 10 years. Such coatings can extend the lifetimes of moving parts in everything from power tools to industrial machinery.

Nanoparticles are used increasingly in catalysis to boost chemical reactions. This reduces the quantity of catalytic materials necessary to produce desired results, saving money and reducing pollutants. Two big applications are in petroleum refining and in automotive catalytic converters.

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. These continuously evolving applications include:

Nanoscale transistors that are faster, more powerful, and increasingly energy-efficient; soon your computer's entire memory may be stored on a single tiny chip.

Magnetic random access memory (MRAM) enabled by nanometer-scale magnetic tunnel junctions that can quickly and effectively save even encrypted data during a system shutdown or crash, enable resume-play features, and gather vehicle accident data.

Displays for many new TVs, laptop computers, cell phones, digital cameras, and other devices incorporate nanostructured polymer films known as organic light-emitting diodes, or OLEDs. OLED screens offer brighter images in a flat format, as well as wider viewing angles, lighter weight, better picture density

IV. CHALLENGES

4.1. Providing Renewable Clean Energy

Balancing humanity's energy demands while protecting the environment is a major challenge. Nanotechnology will help to solve the dilemma of energy needs and limited planetary resources through more efficient generation and storage

4.2. Supplying Clean Water Globally

The demand for fresh water is increasing. Considering the current rate of consumption and projected population growth, some two-thirds of the world will be affected by drought by the year 2050. Nanotechnology can help solve this problem through improved water purification and filtration.

4.3. Improving Health and Longevity

Humans are living longer lives, yet infectious diseases and cancer continue to kill millions annually. Because of an aging population there could be a 50% increase of new cancer cases by the year 2020. Nanotechnology will enhance the quality of life for human beings through medical diagnostics, drug delivery and customized therapy.

4.4. Healing and Preserving the Environment

As a set of fundamental technologies that cuts across all industries, nanotech can benefit the environment in a wide variety of ways. Stronger, lighter-weight materials in transportation can reduce fuel use, nano-structured fibers reduce staining and therefore laundering, and low-cost nanosensors will make pollution monitoring affordable. In the longer term, manufacturing processes using productive nanosystems should be able to build our products with little if any waste.

Pressure on the world's food sources is ever increasing while harvests have fallen short in recent years. It is anticipated that our world population will swell to 8.9 billion by the year 2050 putting even greater demands on agriculture. Precision farming, targeted pest management and the creation of high yield crops are a few nanotech solutions.

4.5. Making Information Technology Available To All including advanced accounting

Humanity will need to cooperate as we respond to disasters and critical threats to our survival. A "planetary nervous system" fostering rapid communication and cross-cultural relationships is needed. Nanotechnology applications in electronics will increase access through reduced cost and higher performance of memory, networks, processors and components.Making Information Technology Available To All.This also includes providing fastest possible computing in the area of Accounting and auditing there by improving effective controls of management.

4.6. Enabling Space Development

Heavy demands on resources and raw materials are creating challenges on earth, whereas these items are plentiful in space. Current obstacles to developing space are cost, reliability, safety, and performance. Nanotechnology will solve these through improved fuels, smart materials, uniforms and environments.

V. CONCLUSIONS

Challenges of nano technology management plays a significant role in evaluating the organization's information security strategy and also it leads to new areas of applications.

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