



## *Nanotechnology in the field of information and communication: Opportunities and Challenges*

Nanotechnology is an enormous scientific revolution, not less than the industrial revolution, which transferred humans to the era of machinery or technology revolution, which transferred humans to the era of space, communications, and the internet. It is also a comprehensive development in the various fields and all branches of science, what is offered by nanotechnology is the ability to make that all the human imagined, but with lower cost and higher quality. The Nanotechnology's capability will be the key scientific advances that will change the parameters of life in a way that we cannot imagine. So, all what we produced and discovered with this technology in the next few years will be the equivalent, but will exceed what has been discovered since the creation of the earth.

Nanotechnology is the fifth generation that emerged in the world of electronics, and was preceded by the first generation which include using electronic lamp and television, the second generation, which include using transistor, then the third generation of electronics, which include using circuit integration, and the fourth generation which include using microprocessors that caused a huge revolution in electronics by producing personal computers and silicon chips that have brought progress in many fields of science and industry.

So Nano means the techniques are made on a scale nano-meters. It Is a more precise unit of measurement metric known until now (nm) and a length of it is one-billionth of a meter, equivalent to ten times the unit of measurement of atomic known Balongeström, and the size of nano is smaller about 80.000 times the diameter of the hair. Nanotechnology means also the technology of micro materials or nanotechnology or micro-miniature technology.

The nanotechnology is using in many applications such as applications of nanotechnology in the world of electronics, as nanotechnology will replace the current generations of computers and electronic devices with new generations of high-speed data transfer and quality in performance and small sizes. Hewlett-Packard will also launch market chips which manufacture of nanotechnology and able to save thousands of times more information than the existing memory.

Despite all, Nanotechnology includes a negative impact in terms of social, military, intellectual property, particularly in developing countries, so the aim of this study was to study the nature of nanotechnology, its history and development, its components and applications with a focus on information and communication, and then analyze the implications for the use of nanotechnology in the field of information and communications.

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