

Nanotechnology science to convergence innovation

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All things, both living and non-living, are constructed of atoms. The nano-scale sparks so much interest because when a substance is artificially created, structured atom by atom, it can have different or enhanced properties compared with the same substance as it occurs naturally, which includes increased chemical reactivity, optical, magnetic, or electrical properties. Nanotechnology aims to exploit these properties to create devices, systems and structures with new characteristics and functions. For example, researchers hope to construct from the very 'bottom' (that is to say, atom by atom) a substance as strong as diamond, but more flexible and far less expensive. It would also be possible to manufacture a substance in the shape and size needed such as a thin string as strong as steel. Nanotechnology Convergence in nanotechnology happened at three levels-namely, convergence in the sources of knowledge for research, convergence in organizational forms to

enable technology development, and convergence at the product level with the embodiment of knowledge in complementary products. While nanotechnology research has been shown to have a dominant focus on material sciences, additional analysis has demonstrated that nano-based research increasingly draws its knowledge from other areas. Specifically, Porter and Youtie reveal that while nano-based publications center on materials science (including chemistry and physics) nano-based research also quite significantly applies in many other fields, including biomedical sciences, computer sciences and mathematical sciences, environmental sciences, and engineering. Consequently, at this level of convergence, the sharing and absorption of research across the involved disciplines will be necessary for downstream value creation.

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