



## 'Designing Innovation in the Creativity Perspective'

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Written by Mohd. Azhar Abd. Hamid, Mohd. Koharuddin Balwi and Muhamed Fauzi Othman, nanotechnology is an experiment that uses atoms or individual molecules as a very small machine component, and measured using nanometers. In other words, nanotechnology is a material and system science along with structures and components that feature physical, chemical and biological repairs. It is in nano-scale scale (1-100 nm). Nanotechnology research in the 1990s focused on testing molecular structure and refining atoms using a scanning copy microscope. The ultimate goal is to create a very small computer and a molecular machine that can perform essential engineering and medical tasks. A scanned copy microscope is used to view and place single atoms and molecules, as well as to drill nanoholes on different types of materials. This technology is geared toward research on the possibility of forming an atomic form, leading to machine manufacturing smaller than living cells and making the material stronger and lighter. Through nanotechnology, better equipment can be produced such as advanced spacecraft, medical equipment that can move in the blood vessels, and improve the problematic living cells and cure various diseases. The exploitation of nanotechnology produces equipments that match the size of the virus that can work faster than the expectation of a human mind. Nanotechnology will change the material in the physical environment and activities carried out in the pursuit of future world development.

The major contribution of Arab-Islamic civilization in chemistry is the introduction of distillation processes, methods of producing essential oils, petroleum, alcohol, minerals such as nitric and sulfuric acid and alkali through distillation. Arab-Islamic chemists have also created the process of hard-boiling soap, improving the glass-making and slicing processes for pottery, and inventing guns or barrels. In addition, the concept of chemical change through several stages or processes is an important chemical engineering concept known as the unit's operational concept. This concept is revived by a modern chemical engineering pioneer, G.E. Davis in England almost a thousand years later. With this, Arab-Islamic civilization introduces the original process required in the field of chemistry, such as distillation, sublimation, crystallization, coagulation, blend and so on. This method is used by well-known Islamic chemistry scholar Jabir bin Hayyan (739-813 AD) who was given the title of the Father of the Arabian Chemistry and is known as Geber by Western

society. His works include the Book of Tafsir al-Uqtuqus, Kitab al-Nur, Kitab al-Ahjar and others.

Chemistry in Indian Civilization is known as Ragayan Shastra, Raja-Vidya, Rasatantra and Rasakriya which means the science of benedi. The work on chemistry in laboratories is known as Rasakriya-nagaram and Rasakria-shala. Those involved in this field are known as Rasad and Rasatantra-vid. One of the important results obtained from this knowledge is the smelting of metals. An Indian chemist, Nagarjuna, tries to convert ordinary metals to gold. Although his efforts failed, his move was practiced now to make metal with gold. The Arabs call the metal conversion technique to gold as al-chemistry, which means metal conversion. After several centuries of India dominated by the Arabs, al-Biruni studied about Indian chemistry and translates them into Arabic. The field of chemistry is growing in China especially in the curing of corpses, as did Egyptian physicians in metal smelting. Evidence of their ability was found following the discovery of the dead body of Dai's daughter who died in 168 before Mashi but still fresh and not rotten. As in India, efforts are also being made to convert low-grade ordinary metals into gold and silver by converting the Yin and Yang content of the metal. The impact of this effort is so rewarding that the creation of a number of important tools for chemical research, including the introduction of a dermal tool to measure the weight of a particular material.

Many findings of scientists, technologists, scientists and scientists can be discussed, but this book only highlights some inventions and inventions from distinguished Muslim scientists. It is undeniable that scientists and scientists of Islam are better known in producing scientific theories, philosophical theories, literature and thought. There are some Islamic inventors who are not only famous in Islamic civilization, but also in the West, among others are Abul Hasan (telescope), Ibnu Yunus (pendulum), al-Kutbi (jam), Muhammad Musa (traveler compass), Ibn al-Hashem

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(photographs), al-Masudi (star-studded) and Ibn Firnas (glasses and flying objects). Even during the Crusade between Islam and Christianity, various inventions of warfare used by Muslim forces have contributed to the Christian army to produce military innovation.

The clash of civilization is very important for discovery, inventions and innovation. The clash of civilizations allows a civilization to gain a great deal of value in many fields, especially in relation to inventions and innovations. There is no civilization in the world that has no effect and influence from other civilizations. There is no civilization that can make the civilization of its civilization as a result of its own efforts and environment. China's civilization took the influence of Indian, Muslim and Western civilization. The Islamic civilization also gained influence from the Civilization of China, India and the West. Similarly, modern Western civilization is now widely influenced by other civilizations. Absorption of influence of foreign civilization takes place in diplomatic relations and war and conquest. The civilization of today's world is deeply indebted to the excellence of Asian civilization for providing a vast and high knowledge of science and technology. The civilization of Asia that allows Western civilization to achieve

its excellence now. They acquire all modern science on the science of Asia which is then brought to Europe and embarked on the renowned Renaissance or Renaissance. From here the Western civilization imitates, improves, enriches and renews all the findings of the Asian world for a better and more useful knowledge. This means that the world's own civilization is the essence of borrowing between the various cultures of the world [1-5].

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