Diabologic: Nanotech -- Coming Soon to a Store Near You
by Frank Dolinar

By now (April 2005) everyone knows the term 'nanotechnology'. But when I first started talking about it in the late 1980s, most people -- including my friends -- looked at me like I had just arrived from Mars. I've been watching this emerging discipline for about 18 years and think I know enough about it to discuss it with some clarity -- and to recognize that there are still people who don't get it, don't get it right, or let some preconceived notion get in the way.

My understanding of nanotechnology comes from the books by K. Eric Drexler, the conferences sponsored by the Foresight Institute, and the technical papers on a myriad of topics that have come out of those conferences. From these sources I have acquired and use the following definition of Nanotechnology (aka Molecular Nanotechnology; aka Molecular Manufacturing):

> "Thorough, inexpensive control of the structure of matter, based on molecule-by-molecule control of the products and byprodcts; the products and processes of molecular manufacturing."
>
> -- from Engines of Creation by K. Eric Drexler

The term 'nanotechnology' is used to describe the general control matter at the nanometer scale -- specifically, a broad ability to control the arrangement of atoms. As such, nanotechnology refers to the engineering / manufacturing techniques used rather than to the size of the product. It is precision building of specific materials, objects, and devices made of selected atoms and molecules, possibly thousands of layers thick, and probably containing billions / trillions of atoms. We're talking about building huge constructions ... when considered from the size of the individual molelcular building blocks.

Materials science, computation, and medicine are three major disciplines expected to be fundamentally affected / altered by a working nanotechnology. The implications are profound and will cut across traditional lines of economics, education, politics, industry, and environmental concerns.

The main reason to pay attention to nanotechnology now, before it exists, is to get a head start on understanding what it will be, how it will work, what it is expected to do (and not do), what some of its implications will be, and what to do about it now to guide its development, introduction, and use in the world of the very near future.

The impact of a working nanotechnology will be orders of magnitude larger than the impact that computers and the internet have had on business, education, research, and our individual lives. We need to start thinking now about how this set of new / emerging technologies will change physical, economic, political, and social environments and what such changes mean for our lives, our communities, our world, and the future.

There are three questions that are repeatedly addressed in the available literature. These are:

- What's possible?
- What's achievable? And
- What's desirable? (..and for whom?)

Understanding nanotechnology and considering possible answers to these questions are important enough topics that I'll return to them in the months ahead.